

A List of Jakun Names of persons.

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Collected at S. Madek.

By H. J. KELSALL.

Men's Names.

Mada
Maidong
P'manga
Pasoboh
K'pal'
Daham
Tuasa
Sedek
Limûn
Hampun

Women's Names.

M'bidas
Lo-ot
G'dont
Li-ah
Pi-ah
Siti
Pochuk
S'pat
Angat
Lipat
Punkat
N'ngo
Didi
Silong
Dông
Che-koek
Nòt
Lek

JOURNAL OF A VOYAGE

FROM

India to Siam and Malacca in 1779.

BY DR. J. G. KOENIG.

Translated from his Manuscripts in the British
Museum.

Introduction.

Jean Gerard Koenig, a pupil of Linnæus was born, in Livland, in 1728, and made his first expedition to Iceland in 1765, where he discovered the plant *Koenigia*, which was named after him. In 1768 he travelled to India where he acted as doctor to the Danish Missionaries at Tranquebar and afterwards was appointed Naturalist to the Nabob of Arcot. He was an enthusiastic botanist and imparted so much of his zeal to the European community there, that a botanical society known as the Society of United Brothers was formed. After visiting various parts of India and Ceylon he started on an expedition to Siam and Malacca at the end of 1778, returning to India in 1779. In 1784 he went to Calcutta, and died (June 26, 1785) at Jagrenatorum.

His collections and manuscripts were bequeathed to Sir Joseph Banks and in due course became a part of the British Museum collections.

The Manuscript account of his travels and observations is included in nineteen quarto volumes, and written in a mixture of antiquated German and Danish in a very bad handwriting, so that its translation is a work of some difficulty. No portion has hitherto been published, but through the kindness of Mr. Carruthers, the Head of the Botanical Department of the British Museum, we have been enabled to obtain a translation of such portions as relate especially to our region. I have added a few foot notes otherwise the translation made by Miss Overbeck has been hardly altered at all. The account commences with the starting of the ship *Bristol* from Madras on August 8th, 1778, on its way to Siam.

Journal.

August 8th, 1778.—After I had overcome many difficulties, good luck favoured me in the end, so that I could prepare myself for a journey to Siam, as well as time would permit.

I started on August the 8th, it was six o'clock in the evening when I went on board the ship *Bristol*, which was commanded by Captain Leith.

The captain himself arrived an hour later, and ordered the the anchors to be hoisted directly, and this was done in clear moonlight, while the wind was breezing up.

9th.—We saw the mountains, called by the sailors the "Paliacatish Mountains" on our left side, they seemed to me to be much smaller and less in number, than when I saw them two years ago, and they are known in the country by the name of "Nazari Mountains." Red Sandalwood* grows on these mountains, and that species of tree is frequently seen, upon which grow the *Myrobalanus citrina*† both of which I have described two years ago, and sent the description to Europe. After we had passed these mountains, the country grew quite flat, our favourable wind left us towards midday, and a perfect calm caused us to advance but little to-day. Towards evening our favourable wind returned, but feebly as yet, and early on the 10th we saw the mountains of Angola, which seemed to me to be much smaller than the Paliacatish Mountains. The calm was the same as yesterday, however we succeeded in getting

* *Pterocarpus santalinus* Linn fil

†

into the sea-water; which was rendered turbid by the river Kiswa, which circumstance is very peculiar, as it lies more than twelve German miles from the mouth of the above mentioned stream, and more than than two miles from the shore. The calm forced my captain towards evening, to cast anchor, on account of the nearness of the land, so that the stream should not drift us in a wrong direction.

11th.—Early to-day, at four o'clock, our captain hoisted anchor again, the wind was favourable but very strong, the atmosphere thick; these circumstances in conjunction caused my captain to feel grave doubts, because there are some sandbanks at this place, and on account of the misty atmosphere the low banks were difficult to recognise. In spite of all this he ordered the sails to be set, and we continued our journey in dull weather and equally dull water. The most interesting thing was to watch how the water of this Kiswa stream and the sea-water met. The waves broke one against the other, and especially the fresh water threw the water of the river quivering up, in the shape of fingers, while the salt water, seemed to rise some what higher where it met the fresh water, which was partly caused by the strong wind. After nine o'clock the weather cleared up a little, and the first thing we perceived of the town Massulipatnam was the flag-staff, and a short time after we saw the town itself and the country through a telescope. This was agreeable to us all, because in the case of contrary chances our journey might have been prolonged for days. At two o'clock in the afternoon the anchors were cast in the harbour, two German miles from the town the water having a depth of three fathoms. The distance we were still from land, compelled me to stay on board for the night, and in the evening, when the weather was calm, and only the soft movements of the ship stirred the water I saw some phosphorescent specks, about as big as a small pea surrounded by a luminous ring. These were probably small animals. I tried to catch some of them, at this time however I was unsuccessful.

12th. Early in the morning I went ashore in one of the boats belonging to our ship. The wind was more favourable to me, than it had been to the captain yesterday, and in one and half hour I landed, which same journey had taken the captain five hours yesterday, The sea-water was not half as red as yesterday

but just as muddy, and I could discover nothing on the bottom. There were neither animals nor plants to be seen, and as soon as we came into the mouth of one of the arms of the big river Kisna, its bed was covered with thick brownish mud, which mud increases the nearer one comes to the fortress which is situated on the banks, and almost entirely surrounded by the river.

The fortress Massulipatam, I have been informed lies on a bank of a minor branch of the big stream Kisna, reckoned by the native heathens to be the fourth in the order of holy streams, which are altogether seven in number, the Ganges being the first, . . . the second, the Cadahverhi* the third, then the above mentioned Kisna stream, after this Kangiret, the Collorham † and as the last the Caveri, but in reality the latter is only a branch of the Collorham, which divides a few English miles from the fortress Tirutphinapalli. ‡

Neither time nor circumstance permit me to enter into any details concerning the superstition of the Indian nation as regards these streams, except this only that it is considered a great happiness to have bathed in one of these streams, because it is said to secure future happiness, and if their burnt bones are thrown into these streams, a great benefit for the soul is derived from it. Therefore many of their chiefs, who have enough money are brought hither in urns from a great distance and with certain ceremonies, either by the Brahmin or their own relations.

I could not look about very much to-day, because in crossing from the ship to the shore, all my clothes got wet as the waves are very strong and towering at the mouth of the river; only in the afternoon I went over the ramparts of the fortress with one of my friends, Mr. D. Campbell, whom I met here quite unexpectedly. This fortress was newly constructed seven years ago by one of the best engineers, Major Steevensen. It used to be a French fortress, but was taken from them late one evening by the English. The French commander at that time was Mr. Conflens, brother of the well known admiral. There exist still many ridiculous anecdotes hereabouts, which do little credit to the French. Now the fortifications consist in a deep trench filled

* Godavery

† Kalerun

‡ Trichinopoly ?

with water, and a low rampart, surrounded by a double wall, with many bastions well provided with cannons. The fortress is almost oval, and measures three English miles in circumference. It is situated directly on the arm of the Kisna, which passes it on its south western side. The country round about this fortress is low and flat, and completely covered by the sea when the flood is high. The eastern and western expanse is unutterably vast, and the ground all round the fortress is covered with mud. One way only, broad and straight, leads to the town, which used to have one of the forts of the fortress just in front, but now the bridge leading to it is demolished, the fort is closed and will be walled up, and at present the fortress has only two approaches, one of them leading to the stream and the other on a slope towards the land.

There are few houses within the fortress and they lie scattered about. All are built of a kind of wood which I did not know before. They are commonly two stories high, and have at the second story a gallery at least on two sides. They seemed to be built in a very cool and convenient fashion though very irregularly. All have been erected by the native Mohammedans, who are here called "Moors." The different stories are seldom higher than $1\frac{1}{2}$; they have flat roofs covered with hollow bricks.

The present head officer, Mr. Ledler, is very energetic; he has made broad level lanes, flanked with trees, some of which are even now already in excellent condition. The Dutch and French used also to have factories here before; the former left this place few years ago, and the French resident was forbidden to show his flag anywhere here in India, as soon as the war broke out, and he has been told to consider himself as prisoner of war, and therefore to keep quiet. Half a German mile from the town towards the North, one finds first some gardens and villas of the English living out here, and further on the big village, where really all the manufacturers live. The factory productions consist of a striped or flowered kind of cotton. The red Indian pocket handkerchiefs are of a pink colour, but are just as durable; and many things not actually manufactured here, are brought hither from distant parts of the country and offered for sale. There is also another kind of cotton material manufactured here, it is dyed pompadour, wears well, and is at this moment a very fashionable dress material at Madras.

Amongst the articles chiefly manufactured in this place is a kind of lacquer work, more common here than anywhere else in India, one sees therefore* cheridans, beds, old chairs, sunshades, the tops of palanquins, painted in this manner, art having the least part in these productions, but the nature and kind of varnish being most important. This varnish is said to be brought hither from Aidrabath and the Sellinique name used here, as well as the one used in Malabar, show that it must have been taken or prepared from a tree, for in both languages it is called Rogganonne, which may be translated into "prepared oil." This oil looks somewhat yellow, but is clearer than linseed-oil, at the same time it is thicker than the latter. It has little smell, neither aromatic nor smoky, its taste is somewhat nauseous and acid, it mixes easily with turpentine, and it forms in this mixture an excellent varnish which can be used even with white colour. It resists the effects of air and water and even the hammer, and the colours covered with this varnish are very durable and never alter with time. The native painters cover the silver in their pictures with it, and so produce the effect of gilding, but in this case the lac is dissolved with it. For ordinary painting they dissolve in it a kind of copal, which is commonly known in India under the name of Damar. All I could learn from the painter who is in the service of the local arsenal was, that it is made from a shrub, growing to half the height of an ordinary man, bearing a kind of long husks, out of the round seed of which this oil is pressed, and furthermore that its name is Stavensetoader or according to the German pronunciation, Agassetti or Agosissetti. According to what he said, these shrubs grow a little below Massulipatam, on the banks of the Kisna stream, however one can give but little credit to what the natives say, therefore I left further investigations to my friend Dr. Campbell.

13-14.—I explored the country in order to get more acquainted with its nature. The flora was extensive because it had rained several times a short while ago. I made a small collection of all the plants I found in bloom, which were more than three hundred, but amongst them were few interesting to me. The calderer plant § which is also called (hiatus in Mss.) formed here the ordinary hedge for the gardens. It is particularly fit for this purpose as it grows to 2 or 3 men's height and very close

* ? Shandrydan.

§ Probably an *Aloe Agave*.

together. Its sword shaped leaves, which are provided with sharp thorns at their edges and their back, do not allow anyone to penetrate; but the drawback in these hedges is, that they take up a great amount of room and that their stems and their shoots being partly descending roots, form larger or smaller cavities wherein all bad vermin finds shelter; viz: the Ichneumon * *Canis aurens*, † and very often *Coluber naja*. ‡ They were just in bloom, but there were only male blossoms to be found, whose scent filled the whole air with its sweetness; I have given a description of them repeatedly and omit doing so here again, because Mr. Arch. v. Linne thinks there is a good description of it by Messrs Solander and Banks. The sandy and little overgrown places were almost entirely covered by the *Indigotea gratissima* which as one walks on fills the air with delicious perfume. I have already described it; it resembles very much the blossom of *Indigofera enneaphylla*, rarely (having) more than two blossoms; its stalks lie also on the ground, but are red and slightly hairy; its leaves are three to five in number, they are mostly oval and unequal in size.

The open field was entirely covered with leaves, resembling those of the lily. Amongst them were some I did not know, but most of them were those of the Indian lily, a new plant, which is difficult to find, because it blooms in April and May without producing any leaves, and only when all has ripened and dried away, do its long narcissus-shaped leaves shoot out. I discovered what it was with certainty by planting the bulb in a garden, where I had the opportunity of watching what I have described the blossoms are not remarkable, this circumstance may be the reason why one has not introduced the plants into gardens. The second kind of the above mentioned leaves was those of *Ornithogalum Zeylonicum*. § It blows at about the same times but has its leaves when blooming. The third kind is a peculiar specimen of *Melanthium*. I have in my description called it *ralicans*, because the tips of the leaves, as soon as they can touch the ground, produce new bulbs; in the Hortus Malabaricus of Rheedee is a good drawing of the leaves. He has not had the blossoms drawn because they are but rarely seen. All the bulbs of these plants are called without any distinction Nari Wanjaram

* Mongoose

‡ Cobra

† Jackal

§ Probably a *Chlorophytum*.

by the natives of Malabar, even the *Pancratium Zeylonicum* and *Mexicanum*, and only in some cases they use Cathe-Wail, Mallec, etc., according to where the flower is found, they call them, wood, field, mountain, etc., Teckchabs, (bulbs being the translation of this word). Their roots have been used intermixed by the French surgeons with Squills, and amongst them *Crinum asiaticum* and the *Amaryllis Zeylonica*. * The French are neither experienced in botany, nor conscientious in their cures, a proof for this being that they call the tendrils of the *Abrus precatorius*, Liquiritia. †

Amongst these lily leaves I found some beautiful specimens of *Ophioglossum vulgare*. In a little pool I saw an *Ardea Gazetta*, holding a meal with several ravens. My curiosity made me investigate why these two guests, so very different in nature, should be together here, and I found that in this pool there were many small fish, young frogs still retaining their tails, and millions of shelled monoculi, ‡ which were now exposed without water. On my return I saw near a pond some birds picking up worms in the damp grass, and by the chattering noise they easily betrayed themselves to belong to the family of the *Gracula rook*. Their head, back, wings and tail were black, above their eyes there was a white line, reaching as far as the neck, the breast was quite white, the beak yellow, at the base red, their feet were pale red, and when they flew I saw some white feathers in their wings. The size was that of an ordinary European black-bird, I am in doubt whether they were the *Gracula Sularis*; the short time I spent here did not give me an opportunity to catch one. I saw the *Phoenicopterus*, § being kept by the Europeans in their gardens for show.

15.—I went across an arm of the stream to a village, which was very prettily situated, and where many big boats and some ships of several hundred tons were being repaired. The boat in which we crossed the river was a palm tree dug out with the root and then made hollow inside; this kind of boats is the only Cottmenous (Catamaran?) sort of raftboat used here. The root end of the tree is several times thicker than the other end and is almost quite round by nature, except where the

* *Crinum latifolium*.

‡ Cypris.

† Liquorice.

§ Flamingo.

numerous thread like roots, which have the thickness of about a little finger, have been cut away, which places are marked by little spots. The other end of the tree is bluntly hewn off, and closed with another kind of wood; on the top it is cut flat on both sides, and a plank as seat for the steersman and those at the oars is nailed upon it. There is an opening scarcely half a foot wide along the whole length of the boat, but the inside is entirely scooped out, and more than twice as wide, specially at the thicker end. They are two fathoms long. They easily upset because they are round. The wood is taken from the black palms.* They are here called Saugeri. All the boats lying here were built out of black palm wood. Those which were built round had some planks from the root and stem of the *Mimosa nilotica*, which grows here very tall and strong. Those however which were blunt at the two ends, had been built entirely from palm wood, most of them being also quite round on the top with a little intersected railing, and all those that wen up the river were built in this way.

I did not find anything particularly interesting in natural history but many pieces of shells which had been thrown up by the sea during the last rainy season, among these were *Telina*, *Solines*, *Ostrea ephippium*, and *Achatina*, and broken pieces of the green *Mytilus* which must have been very big. There was a *Paspalum* growing here in the sandy soil, the stolons were very long, creeping, leafy with a thick, red juicy stalk, the stalk stood straight up and was not surrounded with the flower sheaths of the leaves. The inflorescence was divided into two parts, spreading apart, and each had a short stalk, which was bordered with fine hair; it is very much like the *Paspalum distichum*.

A kind of *Portulaca*, with a creeping, red shiny stalk, and long fleshy leaves with red blossoms,† grew here frequently in the sand, and the *Stipa spinifex* covered the little sandhills here with some Salsolas.

Towards twelve o'clock I returned and had a good boat. The water had risen meanwhile.

16.—I visited the manufactories of the cottons made here, they are not so beautiful as those from Madras, the colours are not as vivid, but there is very little better material manufactured

* No doubt *Borassus flabelliformis*, L.

† *Sesuvium portulacastrum*, L.

here. The Americans living here are the sellers, and spoil the trade very much for others. They take the place of the Jews in Europe.

Many painted articles and much fine linen is brought hither for English society and trade in general.

Amongst the articles principally manufactured here, are the Persian carpets, which are used by the Indian grandees to sit upon; these carpets are mostly manufactured in a village called Elluhr, where the English have a fortress, and which is situated at two days' journey from Massulipatam. The Europeans have some of these carpets woven here, as large as their largest rooms. They look like a sort of velvet, as regards the way of weaving. The threads that form the chain are cotton, but the fluffy part consists of a woven wool, which is taken from some sheep, intermediate between the Indian goats and ordinary sheep. Their hair is rather woolly but very short and stiff to the touch, but when this wool is washed, it has a peculiar gloss, and can be dyed in beautiful rich colours. The horns of the rams stand out at the sides. They are flat and shorter than the ears, the ears are mostly as long as the whole head, which is somewhat longer than that of the European sheep, they have clumsier feet than the European ones, and the rams have no beards. These carpets are very cheap here, though they pass into the hands of the Armenians.

There is another celebrated place near here, called Condapilli, where there are also many manufactories, but notably the best lacquer ware articles in India are said to be made here. The coins in use here are the three Pagodas, these are coined here, and are 10 p. c. better than the star pagodas, besides they coin here ruppies, and have no smaller coin here in either silver or gold, but only copper Duth. These are very big and unshapely coins, and contain almost their whole value in copper, for one Ruppie one receives (value left out in M.S.) Duth, each Duth weighs (weight left out in M.S.) The smallest coins are the kauris or—(name left out in M.S.)

The inhabitants of the Sarkaro are of a much merrier nature, more obliging, more polite and more sociable. There is less vice and deceit to be found among them, nor is the hatred against the Europeans, which is so popular in Madras, as conspicuous here,

A European may take food in their houses and is quite welcome; but every door is closed to the Carnatis, and other signs of dislike are frequently given to them. They explain this circumstance here in this way, that some Europeans, in order to get more friendly with the natives, have inspired them with a hatred, against their own nation, which is said to have given rise to their hostilities.

Their houses are in many places, specially inland, worse than those in the Carnatic, and one rarely meets a Pagoda built of stone, and even these, compared with the Pagoda of Taufchaukin, are wretched hovels. Many have the walls built of mud and a roof of palm leaves.

The sea was filled with a kind of molluse, which seemed to me to have a conical shape and to be of opal white colour; they hung downwards with their tops almost perpendicular, thicker at the upper butt end, they seemed to be divided and overgrown with short fibres, which were either flesh coloured or brownish, ten of them were white. They were about as long as a finger, and near the mouth they seemed to be thicker than a swan's quill; I could not catch any because the order to hoist the anchor was given just at this time. I hope to obtain some at the place we are going to.

18.—We went on board again, the anchor was hoisted, we had a fairly good wind, and the captain continued his course towards another place, called Nahapur, which is situated about fifty English miles further north. Towards three o'clock we had a very strong south-western wind together with some rain, and we were brought to our anchorage towards 6 o'clock in the evening. We cast our anchors about five English miles from the shore, the water being three fathoms deep, and the ground being very muddy. We were quite close to a sand-bank, which runs for some miles into the sea. There is also the mouth of an arm of the river by far bigger than the Kisna, called Ghodawetu, which also sends red muddy water into the sea. It was too late to-day for going ashore, but the captain sent a letter on shore, and early in the morning the captain and I went on land, we were about two hours on the sea, ere we reached shore, and there we found palanquins already awaiting us, which were to take us to Madepolam, a place situated fifteen miles inland. The first thing I found on shore was the *Paspalum* I had seen near Masulipatam,

and secondly the *Milium*, both of which were more perfect here. The arm of the Ghodaveri stream forms here many big and small bays, which could shelter a whole flotilla, if only at its mouth the water were deep enough. We passed many muddy minor arms of the afore mentioned stream, which the palanquin bearers waded through; the water was however all intermixed with salt water which was proved by the circumstance of the Kali growing in abundance, some species of *salsola* and *Chenopodia*, and also some *Bontia*, growing here as a tiny shrub. There were innumerable brown shoots standing in the muddy soil, they were pointed, longer than a foot and resembling the stubbles in a field. Further inland I frequently saw *Excæcaria* of both sexes; but very rarely *Rhizophora*.

My palanquin bearers took me across a wide arm of this stream, which was filled with a plant whose leaves were hairlike, but my people would not stop, because the water issaid to be full of crocodiles, By chance I got some specimens of the *Ruppia maritima* by means of my stick, whilst sitting in my palanquin. This is a plant I had not found in India before.

Then we came to some meadows, upon which grew some specimens of *Eyshosia* (*Tephrosia*?) with big yellow flowers. I have seen this plant several times growing somewhat taller than a finger, but those I saw here were almost one foot high, they looked very pretty among the smaller *Evolvuli* and the *Schoenus* Other plants were not yet in bloom here, because the rain had begun to fall.

We passed a narrow but very deep arm of the river, said to be full of crocodiles, in two palm boats, or Saugeri, as they are called here, tied together.

The shore was rather higher here and a little further inland there stood millions of palms and coco-palms, very few other kinds, and these were, *Mimusops Kauki*, some *Cratoeva Tapia*, some already in bloom, a few plants of *Petalium Murex*. In places where the soil was composed of red sand, there grew a kind of grass of a beautiful green colour with distichous leaves lanceolate acute shining waved on the surface. I could not see whether this was *Panicum capillare*,—because not one among so many thousands was yet in bloom,—though they looked very much like this plant.

At last towards 12 o'clock we arrived in Madepolam, and we took quarters at the Factors' horse.

Madepolam is a big place, having manufactories, especially fine cottons are made here. The streets are irregular and narrow, but the houses better than the usual ones in these countries, they are bigger and many of them are built of wood, like those in Masulipatam. The mud-houses were covered with a kind of pipe clay and look ashy grey and they have some white stripes running all round, consisting of small triangular dots arranged in rows.

The people are even merrier and more polite than I had found them in Masulipatam, their rooms are clean and they sleep small beds, a thing rarely seen near Madras.

The Dutch used to have a manufactory here as well, but they have left it, and the building is a ruin.

The manufactory which is now in the possession of the English as well as the whole country, used to belong to the French. The factory consists of three substantial houses, built in European style and besides there are some warehouses to store the goods in manufactured here.

These houses lie at the eastern extremity of the tower, close to the rather high bank of a big arm of the Godaveri, in a very pleasant part of the country.

In the afternoon I looked round for some plants, and found a new species of the family of *Boerhaavia*. It had indeed five stamens but everything else showed that it belonged to this family; therefore I was not willing to separate it from this class. It has opposite heart shaped leaves, which are covered with white soft shiny hair; *carissa arborea* had beautiful blue fruit as large as a plum, and they were in such abundance that it looked more blue than green. There is a very good red jelly made from the juice of this fruit.

I saw here the *Cœsalpinia Nuga* for the first time, it is an excellent shrub for hedging purposes where the country is flat. There was a species of *Excoecaria* with long pointed leaves very shiny above but they were not as juicy as those of the ordinary kind. There was a *Monoica* bearing the male spikes on the same tree, the fruit were generally as big as a lemon, the tree was scarcely two metres high. I obtained some beautiful ripe seed of it.

20.—The Factors took us to a garden belonging the Bem Ross or Raja; it lay some miles inland. The whole way thither

passed through very pleasant parts of the country. We saw many kinds of birds near the water and at the same time many of the above mentioned *Gracula*.

From the garden we saw at some little distance the residence of the king, which is a pretty strong fortress in a favourable position, but the king has no garrison in it, and does not need to either, because he is sufficiently protected by the English; he only has the number of people necessary for his comfort or state.

The garden was very large and full of useful trees, many *Plumieria* had been planted along the principal paths, they looked very well with their long, striped, and folded leaves. In the garden itself I found a small *Pandell*, upon which grew a kind of creeper, with very beautiful white blossoms that had a agreeable perfume, it was one of the *Contortae*.* There were some flowers at the raised ends of the branches, and generally three on one stalk. The calyx had five lancet-shaped expanded concave, smooth membranous leaves, and they grew at the same distance from the floral crown by means of a short stalk. The floral crown was funnel-shaped, the tube had five furrows, was smooth, whitish green and shorter than the calyx; the limb was divided into five parts; the flaps spread out and grew vertically on the tube, each of these flaps was oblique, lancet shaped, wider than those of the big jessamine. The stamens grew in the furrows of the tube and were quite short; the anthers stood erect, they were linear and divided in two parts at the tips. The style simple, stigma obtuse, pistil oblong angled. There were no capsules bearing fruit to be found. This is always the case if plants have been reared from cuttings or slips, I therefore could not find out what class it belonged to. The broken twigs had a milky juice.

I also saw a new specimen of grass among the brambles, which looks very much like *Phleum*. On our way back I was delighted to see some exquisitely fine blossoms of the *Nymphaea*† *Nelumbas*. Amongst others I saw one of a blue colour. *Cyperus elatus* was here mostly growing to the height of a man.

After our return the gentlemen took me to see some of the principal people who print or paint cottons. There are two different kind of people employed in this printing and painting of

* *Apocynaceae*.

† *Water Lilies*.

cottons. The printing forms are carved of Teak wood, the biggest of them being little more than one foot long and half a foot wide, but I often saw smaller ones according to the pattern. The man printed in my presence some red and black cottons. The stuff was first of all strongly saturated with alum and kaveksy (*Myrobalanus citrinus*), so that it had a greenish yellow colour. This stuff the workman spread out over a wooden bench, which was $1\frac{1}{2}$ feet wide, four feet long, and one foot high. There was some of the coarse wollen material used here, spread over this bench in several layers. The colours had already been prepared in little flat boxes; these boxes were $1\frac{1}{2}$ feet long and one foot wide and had a border about as high as ones' hand. There were some little rods lying inside, which were tied on two sides, the rods coming from the sides were a little longer than a foot and across them were tied some other rods somewhat shorter than a foot; they stood about half an inch apart, each rod was $\frac{1}{4}$ of an inch wide and hardly 2 lines thick. They consisted of bamboo or thin split rotan. These rods were not fastened to the box, but were tied together and could be lifted out of it independently. Over these rods were some layers of woollen cloth folded several times and being a little longer than the rods. On and between this cloth the colour was really placed, and the rods were only meant for the purpose of dividing the colour more equally; there was so much colour in these boxes that it was almost equal to the cloth.

The red colour consisted of sappan-wood boiled with alum, and mixed with the gum of the *Mimosa nilotica*, so that it was altogether as thick as honey, without any further addition. The black colour consisted of old iron on which was poured Toddy from the palms, added to this a little *Myrobalanus citrinus*, in order to render it very black, then it was mixed with the above mentioned ingredients to bring it to its proper thickness. When the printer begins printing the stuff, he takes the wood pattern, and putting the same on the cloth in the box, presses it down a little, and then places it on the prepared linen, knocking it first with his fist and then with a club of about one foot in length, which at the thicker end is of the size of a fist. One knock with this club is sufficient to print the pattern on the linen, and in this way he continues, filling the patterns and colours very accurately, and all this is done very quickly indeed.

There are also some kinds of cotton manufactured here with a gloss over them, and figures were mixed amongst the flowers.

Afterwards I saw the great ponds, used to bleach the fine kinds of linen, and ended up by visiting the graves of the first Europeans, over which monuments as big and in the shape of houses have been erected ornamented with rich sculpture. Amongst them was also that of an English lady buried here almost hundred years ago; she had been called Hattung, as a big black gravestone, hewn out of rock and polished, announced in wide, sprawling Latin writing.

In the afternoon I visited the men who manufacture the lacquer-wares, hoping to get some more information regarding them, because there is here a more direct communication with Aidrabath, but I was not successful.

I saw that they fill the joints of the little boxes intended for painting, with an ordinary paste of *Causch* (cutch?) and ground Tamarind bark, after which they made a foundation for the lacquer ware with a finely ground fat pipe clay and *Causch*. The rest of the work is very simple. The lacquer-wares here are superior to those of Massulipatam, specially the black ones.

21.—We went back to our ship quite early. On our way thither it rained; I looked very eagerly for the molluscs, but the water was too turbid. In the evening our captain started for open sea.

22.—The contrary wind was much against our proceeding quickly on our journey, we were between Massulipatam and Narhapuhr, where we cast anchor. The little wind there was was contrary to us.

23.—We had lost sight of the coast but advanced very slowly.

24.—The wind though weak in the morning, let us keep our course. We saw some Dorados swimming at the side of our ship. In the afternoon the wind grew stronger and one of these fish was caught with a three pronged iron.

25.—There were many Phaetons flying round the ship, the sea was very rough. We were at fourteen degrees latitude.

26.—A kind of sea bird flew across the sea; they had long narrow wings, which were white underneath, their back was brown, and round their beaks they were black. I could not

distinguish whether they were a kind of Alca or Sterna. I saw now and then some balls of foam fall down from the air, they were as big as a fist, and immediately dissolved on touching the sea.

27.—The air was very rough to-day and disagreeably cold, though we were under the twelfth degree of latitude and the sun was close to its meridian, towards evening we had some showers on account of the strong south-west wind. There was little to be seen on the surface of the sea, only the flying fish rose in shoals, persecuted by the birds above described,

29.—To day we had heavy showers, combined with strong south-west wind, the sun never appeared, but we supposed were advancing towards the 11th degree of latitude. In the afternoon we had strong wind combined with some rain. Some very large Albicores and Dorados accompanied our ship, we also saw some Delphen Orca and some *Succi* swim past, this made us hope that after this rough, unpleasant weather, we might soon see the land again.

30.—A strong N.W. wind, which arose this morning, combined with rain made us advance very much on our journey, but towards 10 o'clock in the morning the wind turned; we reached to day the 10th degree of latitude. In the afternoon we had again strong west wind, inclining to the south-west and showers, the wind being very strong.

31.—The air was very misty on account of the strong wind, specially the horizon looked as if it were covered with smoke, the sun just peeping through. I saw some birds of the same size as those mentioned before flying over the waves, in order to catch the flying fish as they rose in little shoals. Their size and proportions were like those of the others, also as regards the long narrow wings and their whole body was brown, and at times they shrieked as they flew along. I also saw a *Larus* flying round the ship. At 9 o'clock land was discovered from the mast. The sails were set and the course directed straight towards the land. A quarter of an hour later we could distinguished the land from the fore deck, it rose before us like smoke and seemed to be high and hilly.

As we approached the land we could from time to time distinguish some white sparkling spots especially close to the summit of the mountain, we took them to be chalk stone, but as we

came nearer, we saw that they were a peculiar kind of fields interspersed with green.

Our Captain knew this country very well, it was the first of the Nequebar * islands, which is called "Kare Nequebar." He therefore ordered the ship to be steered towards its north-eastern coast, in such manner as not to come too near a stony bank stretching far into the sea. The more we approached the land, the more agreeable it seemed to the eye, on account of the pleasant change of wood with green fields and trees standing in thin rows between them. There was such perpetual change of scenery, that it was almost impossible to believe this island to be inhabited by uncivilized people. One field was specially conspicuous. It reached in a slope down to the sea, and there was bordered by a row of thinly planted trees, the waves beating against it with great violence; in all other parts the sea was bordered by thick trees like by a wall. After this we passed another side of the island pretty closely, this coast not being dangerous at all, and at the same time we came behind the wind. The ship cast anchor a quarter of a German mile from the shore, the water being fifteen fathoms deep. It was then 3 o'clock in the afternoon.

Necquebar. (Nicobar)

The country seemed to be level and flat for about one German mile, and was thickly overgrown with trees down to the seashore. There were some semicircular openings hewn out, in which one could perceive several houses with thatched roofs.

We had scarcely cast anchor, when some of the natives of Necquebar came in their canoes, they arrived rowing in silence. There canoes were long, narrow and pointed, they were hewn out of trees, the best of them having a thin staff about $1\frac{1}{2}$ man's height, right in front, at the end of which was fastened a little flag by means of diametrical pieces of wood, the flag however was not moveable, and stood out straight in front. There were two bamboos tied to the top of the canoe, about one foot apart from each other, and at one side there was a kind of wing fastened to the same, for the purpose of preventing the canoe from being overset.

* Nicobar.

This wing was made of two bamboo sticks as long as the eighth part of the whole length of the boat, and to these were tied two other bamboo sticks which stood out at the two ends, they were twice as long as the width of the boat and at the end of these cross sticks, another bamboo was fastened running parallel with the boat, and standing out as much at the front part, as long as the pointed end of the canoe. The smaller boats all had this arrangement, only they had no staff for the flag. There were more than eight men rowing the big boats. Their oars were lancet shaped as far as the middle and had a protruding sharp cornered point. They were thin and smooth, about six inches wide, the handle was round and short, their whole length being about four feet; they were made of a sort of brownish red wood.

Those of the natives that came on board were mostly young, except their captain who was rather old; he had received a name from a European captain, who frequently came hither, viz: Makintosh.

Their figure is very much like that of the Malays, they had round heads thickly covered with short coarse hair, a large forehead, round small brown eyes, a flat nose, thick lips and large faces, big teeth red with Betel, and thin black beards; they were of a light brown colour. Their shoulders were large, and they seemed to be muscular, their veins were more prominent than is commonly the case with the black, their calves were very much developed, but they were all only of medium stature. Their clothing consisted of a piece of coarse blue linen, about three fingers wide, which was wound several times round the lower part of their body and taken up between the legs; some of them wore old straw hats. At first sight the expression of their face seemed to be wild, but one soon lost that impression; they showed few signs of any passion, smiled in drawing their lips up on one side, and when they felt offended they walked away without any sign of anger. The principal articles they brought with them were cocoanuts. Some of them had little square boxes the biggest of them being one foot long, they were made from the sheaths of the young leaves of the Chamærops,* and they contained many varieties of †Amber for sale. There were

* Probably a Licuala.

† Ambergris ?

some pieces of one or two drachms weight and they were wrapped in leaves, among them one kind very much resembling Benzoin but not having the same odour. As much as I could make out from the interpreter this piece like all the other pieces had been thrown on shore by the sea, it seemed to have been burnt at one end. The payment for these articles was mostly made in tobacco or blue linen. A bird was brought, one of the ordinary (missing in M. S.) which by the sailors is called (missing in M. S.). My curiosity and longing to see the country were very great, but the time passed with necessary arrangements in reference to the ship and also in talking to the natives of Nacquebar. At last, at 4 o'clock the captain ordered the boat to be put out and I set out for the shore, feeling very glad and happy. But on nearing the land we perceived a strong breaking of the waves against the shore. We chose a little bay, which seemed to have sandy banks, because it was guarded on both sides by high cliffs. A big wave seized the boat and threw it with great violence against the shore, a second bigger wave followed, which filled the boat, broke one of the oars and some parts of the boat itself, besides terrifying us greatly. I did not want to wait for the third wave to come, but jumped down into the water, which reached up to my waist, in order to escape a greater danger, and all I had taken with me was soaked.

The shore was rather steep in the beginning and there were many little bays, covered with a whitish yellow sand. The above mentioned stone cliffs consisted of grey coarse chalk-stone. Here and there big pieces of different kinds of corals had been thrown up by the sea, among them one kind which had the appearance of many knife-blades grown together, I do not remember having seen any of this kind before. Higher up on the shore there were innumerable varieties of blue, black, red, brown and white corals, among them also the so-called "red organ." I also found a peculiar kind of very coarse sponge, and many kinds of shells were thrown up very high, many of them had been thrown into the woods for some little distance. The whole shore was not of a man's height, and it almost immediately sloped down again towards the wood.

The first plant on shore, which I met pretty frequently was *Crinum Asiaticum*, which was in blossom, and these blossoms were perfect, as they had not been touched by any insect, an occurrence

very frequent on the Coromandell coast.

Scoevola grew here almost as high as a tree.

The big trees, along the coast, which we had seen from the ship, were a kind of trees with pinnate leaves having the appearance of false-varnish trees of which Kœmpfer has given an illustration, furthermore there were *Hibiscus Tiliaceus* some *Terminalia catappa* but a mistake caused by the resemblance in the leaves with those of the *Terminalia*, made me take that tree for the latter, until I saw a large branch hanging down, bearing square conic fruit, this attracted my attention more closely to this tree.*

The stem was only low, its bark bearing much resemblance to that of our beech-trees, and its circumference was hardly as thick as a man, the crown was oblong, the branches were placed without any special order, and all directed upwards, and at their ends they had many bare places, where the leaves had fallen off.

The leaves were placed at the end of the branches, very closely together, and had no stalks; they spread out and were obovate quite entire at the edges slightly turned back, smooth on both sides, the upper side glossy and light green, the lower one white and bare. The principal veins of the leaves run in opposite directions and spread out very little, being white like the principal middle vein, the leaves are fleshy and about one span long.

The blossoms are placed at the end of the branches in a simple raceme, the common stalk is directed upwards, and irregularly flattened at the sides, it is smooth and shiny, and where the stalks of the single blossoms begin it is as thick as a finger, and longer than the width of a hand. The proper flower stalks spread, they are single, round, smooth, shiny, somewhat shorter than the common stalk, and as thick as an ordinary quill, their number varies from 7 to 12. The swelling at the beginning of the stalk, continues for some time in the common stalk, its ridge is thick, round, smooth and shiny and ends abruptly where the bract begins, which is patent, sessile, oblong, smooth, shiny, bare, resembling the leaves and grows as long as one inch and a half. The blossoms are superior.

The calyx consists of one leaf, which splits right down to

* *Barringtonia speciosa*, Forst

the base when the flower opens, then the two parts are patent ovate, with marked veins, somewhat fleshy, concave, one inch long and persistent light green. The real flower consists of four oval, concave white petals red at the edges, they are a little longer than the calyx.

The stamens are very numerous, they are joined together at the base, a fleshy skin surrounding them, as in the *Eugenias*, they are like thin threads, smooth, shiny, milky white as far as the middle and towards the end beautifully pink, they are twice as long as the flower and fall off.

The anther oblong four plicate yellow. The ovary is situated underneath the flower and renders the stalk imperceptibly thicker and square. The style is threadlike, thicker than the stamen, smooth, shiny rose coloured, persistent, and three times longer than the stamen. The stigma is flat, perforated and white. The receptacle is umbilical, and rough.

The fruit is a square pyramid, a little longer than it is broad, at its end stands the divided calyx straight up; they are rounded, the surface is smooth and shiny; greenish white in the beginning, changing when ripe into a brown leather colour; inside it is filled with stiff, flat viscous fibres, surrounding an oval seed bigger than a pigeon's egg, which has a hard, thin shell, the taste whereof is very bitter.

In all probability this tree is the *Mammea asiatica* more especially that which Mr. Osbeck has seen near Java, only it has escaped his notice that the blossoms are borne on the ovary that the stamens are all grown together at the base and drop off independently of the flower, the stigma is flat and perforate, the fruit is described as a pear, and as being divided in to four parts. This partition is caused by the circumstance that they are crossed by the in the inferior ovary time of bloom and shortly afterwards, and so it presents itself in the shape of four rose coloured partitions, one of them generally containing a white round seed as big as a mustard seed. The three remaining partitions in all the specimens I have seen, were either quite empty or contained only rudiments of seed. It is very rare that more than one partition contains any seed, and if so, these disappear soon, and only one of them generally ripens and fills the whole fruit, I have cut many of these fruits and always found them as I described them. The fruit is a real Drupe. The sea

carries these nuts to many shores of India, near Tranquebar they are picked up and used as medicine, as there is some superstition attached to them. One side of the fruit resembling a stiff brush, is used by many for polishing and cleaning metal. The fleshy part of the fruit turns woody and brittle.

Among these trees *Ischaemum*s grew frequently including *I. muticum* and a new species of grass, very much like the *Lygeum* the stalk is creeping, has joints and short lancet-shaped spreading leaves. The stalk bearing the fruit is erect, hardly two inches long, the spike is hardly longer than the involucre, this is secund but contains 2 to 3 male spikelets underneath them a very tiny female one, which bears a nut or ball-shaped fruits, protruding at the upper part. I often found this grass in Ceylon near Trinquemalle, but incomplete, but here there were many specimens, bearing fruits. †

Behind the above mentioned trees grew a great quantity of *Clerodendron infortunatum*, which looked very well with their blossoms red as fire and their blood red flower stalk, their leaves were more than one foot long. Among these grew *Dracontium* with its prickly and spotted stalk and its leaves, divided into long strips; they do not blossom at this time of the year; besides there was the common kind of Kaldeeren, § and among them another species of the same family, which was growing in great abundance; close to the root the bark was split, but higher up it was smooth, striped in rings like the ordinary specimens. The branches were few in number and grew close to the stem only near the top, the leaves grew at their ends and formed a sort of crown, but they had no thorns like the ordinary ones but were smooth and shiny, some were more than man's height but the stem was not thicker than a thumb. There were many shrubs with big leaves, among them some which had no fructification. Upon an old Banyan fig tree, *Asplenium Nidus-avis* grew in abundance, *Cyperus Iria* was to be found in abundance in damp places. On some trees grew a *Boletus* hemispherical sessile coriaceous variegated with white and ashy semicircles.

There was a shrub growing about man's height, it had only a few principal branches, which were generally five-cornered

† *Thuarea sarmentosa*, Thou.

§ *Pandanus*

There was a shrub growing about a man's height, it had only a few main branches, which were generally five-cornered and covered with a brown bark. They had fruits looking like pears, being round, rather flattened at one end, they contained some 5 or 6 angled seeds as big as a pea; in the unripe ones one could well recognise the three flat tyles, divided into two parts at the end. There were fewer male blossoms; they had short stalks which stood at the angle where the leaves joined the branch; they consisted of a green calyx divided into (three ?) parts, oval, and white near the edges, they had no perianth. The leaves were oblong, smooth, soft, thin bifarious; probably it is the same plant of which Mr. Osbeck speaks in the German edition, page 267 as *Frutex baccis lbis, folas obverse ovatis*, but these were not so, and the pears are eaten there are sweet and mealy. There is shrub growing on the coast of Coromandel which is very bushy and rarely more than a quarter of a man's height with obverse cordate alternate leaves which is sure to be another species of this kind; it resembles both the *Agyneia* and the *Phyllanthus* but its blossoms are much bigger than those described by me above. There were many plants here too, with grass-like leaves; they probably belong to the *Monandria*, but I could not find any blossom.

The *Agyneia vitis-idea* had large leaves here, but was only a small shrub. *Datura metel* and *Urena lobata* grew in the neighbourhood of a village. The greatest part of the wood consisted of coco trees, the nuts of which lay on the ground; many of them were in a state of putrefaction and some germinated.

Near a village I found *Poa amabilis*,* *cynosurus indicus* † and a new delicate species of *Poa*.

As it grew dark I went to one of those hamlets, where about twenty houses, most of them with pointed thatched roofs stood on piles. The principal houses, three in number, were placed in the middle, but each separate from the other. They were built on piles about 10 to 12 inches thick, and more than a man's height. Some of them had 24 to 30 of these piles; they were bamboo, and one side was open where a bench hung by ropes, large enough to allow two people to sit upon, and so low, that their feet when sitting would touch the ground. The roof of the real dwelling house was in some cases angularly pointed, in others rounder;

* *Eragrostis amabilis*, R. Br.

† *Eleusine indica*, L.

very few showed a long ridge. The access was gained by means of a narrow well-made bamboo ladder, through a square hole, which was wide enough to afford admission for a full-grown man; the floor consisted of broad sawn planks of unequal length supported by the cross beams; these beams in their turn resting on the above mentioned piles. The big houses were divided into stories, the lower one being as high as two men, the upper one was lower and more like a barn.

Round about on the principal rafters, there were some bamboo sticks hardly as thick as the thumb fastened across. This looked very nice; but there were no windows at all, nor any to replace them, but the light came only through the hole holes serving them for door, therefore it was very dark. All their household implements were standing round about, mostly tied to the bamboo; that which could not be kept in this manner had been put into small boxes, which were one foot long, half a foot wide, and hardly half a foot high, and were provided with lids, which were made, as I have already said before from the partitions sheaths of the young *Chamœrops* leaves. These little boxes had been tied to a bamboo, which was fastened right across the room, and was therefore at some distance from the roof.

There was great cleanliness as regards the floor and the air also was very pure, not the faintest disagreeable odour could be detected. The upper story consisted only of bamboo sticks, they were thin, not tied together, and resting on the cross beams; they had turned somewhat brown through the smoke of the lamps, but I could not see that they kept any provisions there, and on the whole they do not collect many provisions. I saw some piles erected near some of the houses, they were more than man's height, two cross piles were fastened to them and here they stewed some yam roots in the open air. They had no gardens, their houses and also their outhouses stood alone *Carica Papaya*. Their weapons consisted of small lances somewhat shaped like pikes, which were made of smooth round sticks about as thick as a finger and three yards long. I saw some of them return with these kind of weapons. They had been in the wood to fetch provisions for one or two days. I did not see any fishing implements.

There were two ships there, one of them an English three-master, the second one lying further south with two masts,

it was a French ship. They were both loading coconuts, which they bought here very cheaply in order to take them to Pegu, and to sell them there with great profit.

Their women have almost the same appearance as their men, being strong and muscular, but most of them had their hair shorn off. Their clothing consisted of a blue cloth wound round their loins, or they wore an apron made of leaves, which was cut in strips hardly one line wide and reached down to the knees; they were plaited together at the top and hung round their bodies in layers almost two inches thick. These strips seemed to have been taken from the Borassi or Chamærops. Some grown up girls I saw here as well, their hair was cut off below the ear and hung loosely round their head.

However many people I saw here of different sex, I did not come across any whom I could have termed old. The only exception was a woman, apparently about fifty years old. The shortness of my stay here prevented me to make further researches and inquiries, which besides would have been very difficult considering the language and utter simplicity of the natives. As far as I could observe they were very vague in their ideas as regards years, months, weeks, days and hours.

Near one of the large houses I saw some piles; they were about ten inches thick square and two and a half feet high. At the upper end they had two holes, meeting in the middle like a cross; through them were plaited many coloured ribbons both of linen and of cloth, presenting the appearance of streamers; at their end there was a stick about as high as a man, at the end of this a piece of white linen was fastened of about two inches wide, looking like a flag; all this was surrounded by a sort of conical figure of the sheaths of the Chamærops, so that only in front a little piece of the streamers was to be seen. I made inquiries as to these things, and they told me they were monuments for the dead, and that lately three persons had died in this house. I saw some more of the same kind of stakes which were already old, but there was not one near every house.

I saw some persons of both sexes wearing green fringes, and I inquired why they were in this manner distinguished from the others; as much as I could learn from my interpreter these were those who had held their feast of love. This is always celebrated in the woods, never anywhere else, and as a sign of this

joy they wore these fringes; they were really made from long Pisang leaves split through the middle and fringed crossways, They are first worn round their neck, then across their shoulders, and at last round their loins.

My attention was attracted by a continual murmuring; I inquired into its cause. It was the singing of some women, who wanted to cure another of her headache. This afforded me at the same time the opportunity of seeing the interior of their houses. I was admitted and allowed to mount, and I found the invalid sitting on her feet, some of the women lying near her and four standing before her; one of them held something in her hand, which was supposed to be some article for fumigating, I could however neither see nor smell it. Their whole song consisted of one tone, which was taken first at a very high pitch, but by repeating it so often they slowly sank to the lowest notes, then they paused and one of them commenced again very high, and the others chimed in until they had again arrived at the lowest notes. They kept on singing in this way as long as I was there, which however was not very long, because it soon grew dark. I felt the invalid's forehead which was a little warmer than ordinarily and covered with weak perspiration. Her hands were also hot and her pulse quicker than usual, which symptoms might point to a cold in a body inclined to laziness.

The number of children that I met here was not large either, and was far smaller than what I had seen on the coast in villages of equal size. I saw very few animals here, they kept some pigs near their houses, and the pork is said to be of very good taste here, because they feed the pigs on coconuts. There were also some small hens here, and a female dog, very much like the Pariah dogs, which I had seen on the coast, and probably it was brought from there, only it seemed to have shorter legs than the ordinary kind.

There were many swallows flying about near the sea, as far as I could see however they were of grey colour, and as big as those near the coast, and therefore I doubted them to be of the kind of those that built the valuable nests.

I only saw a few parrots and not one butterfly unknown to me; only the common ones that live on the *Nerium oleander* and have the gold coloured chrysalis, and another kind living on the Mangos, being pearl coloured with black veins. One kind of moth

of the species living on the fig-trees and all having striped wings. The ones I saw had red spots on their lower wings, a circumstance which I have not noticed in any species known to me heretofore.

As it grew dark I left the country where, I should have liked to stay for some days, but I feared we might not get safely through the high waves. A *Cicada* sang in the wood in a strange manner, for me it was a sad song. In the dark evening I picked up a little piece of seaweed which had been thrown on shore. We were luckier than we had feared to be as regards the starting from shore, which we left after having explored the country for one hour and a half. After one hour's journey both ways, we arrived on board at 7 o'clock.

September 1st.—Early this morning the anchors were hoisted, but hardly had we left the land when a storm combined with heavy showers of rain arose. The atmosphere was misty and one of these stormy showers was so violent and sudden that we almost perished. A new top sail was torn to pieces, the waves at the same time were uncommonly high and the whole sea like in a thunderstorm. I thanked God that I succeeded in arranging the specimens, which I had gathered on my journey.

2.—It was still stormy, but not as bad as yesterday. We were on the 8th degree of latitude N. and some minutes. The showers were less violent and fewer in number. I watched the afore-described brown seabird with the strange cry, and I often saw it fly so low that its feet touched the water. The *Exocetus** occurred frequently in these parts.

3.—To-day to our great joy we saw the sun appear through the clouds. The wind was delicious and we sailed fast towards the Strait of Malacca. The sea itself grew calmer, and we felt great joy after all the adversity overcome. We were visited by some *Phaeton aethera*. We were on the 7th degree and some minutes

4.—We had fine weather and wind, but it did not continue so far very long. Towards midday I saw the sea full of a purplish red kind of Medusa. It was seldom bigger than a Spanish dollar. The head was undivided, the arms had a pretty big base surrounded by an overhanging skin; they were many times longer than the whole body was wide. I have seen this Medusa

* Flying-fish.

already in different places, both on my journey to India and on those to Ceylon. There was also much green matter swimming in the water, some of it looked like a Medusa, but it was very deep under the water. There were many parts of the *Medusa porpita*; there are rarely any living ones to be discovered. Many fruits of the different kinds of Rhizophora were floating on the sea. A Diomedé* was caught, which was very thin. We were on the 6th degree north latitude. The sun at his setting, showed many little cloudlets resembling scales, which presented an admirable picture of fire and purple and now and then one saw big spots of vivid sea-green colour slightly intersected by darker shadows. These were held to be a sign of storms to come.

5.—Early to-day we had heavy rains and contrary wind and were hardly able to keep our course. We saw Pullu Pera at a great distance on our right hand. It is said to be one solitary rock quite uninhabited; to us it looked like a low cupola.

6.—To-day we had alternately contrary wind, dead calm and some showers. The current brought us near the land and we could see Pullu Lada quite distinctly; it consisted of several small islands, which are very high and mountainous.

7.—The calm continued; or when there was any wind it brought showers of rain and was contrary. Towards the evening one anchor was cast, because the current might bring us too near the land. We saw many kinds of birds, which however kept at a distance. The sea was full of the seed of the Rhizophora.

8.—To-day we approached the rocks of Pullu Lada as near as one German mile. We contemplated them through a telescope because we did not wish to get any nearer to them. They were of different sizes, all were narrow and divided from each other by channels. They all consisted of rocky mountains, which seemed to be very steep at the side facing the sea, some of these mountains were long in extent and full of clefts, only a few had the shape of a cone. One among them resembled entirely the Lion Mountain of the Cape, with a high ridge which gets lower towards the neck. The peak was quite narrow, conically rising, almost every where covered with trees; except at those places where the rocks hung over or were very steep where there was no vegetation of any kind to be seen. We could

* Albatross.

specially distinguish some trees with very high trunks growing on the ridge of a long extended mountain. The ridge of the highest mountains seemed to be surrounded by clouds. The peak of the Lion mountain forms an exception and its woods seem to lie more in the valleys. The stones resemble a Petrosilex and are best observed in a perpendicular clift in one of the mountains. I think the last thing it could be was either felspar or granite, many mountains of the Coromandel coast consisting of this rock. In many places the rocks shewed lines as if they were columnar, but these lines have been caused by the rain loosening certain fine particles of the rock, and forming on its surface a kind of tufa. This is a common occurrence in rocks sloping down perpendicularly. In one place the most beautiful red showed between the stones; however beauty is always enhanced by the ardent desire to possess a thing.

There were some people on our ship, who formerly had cut down some big trees in these islands, furnishing them with a beautiful yellow wood, fit for joiners' purposes.

9.—To-day we had the same fate as regards calm as we had yesterday. The specially lucky circumstance, that our carpenter had to caulk the ship on one side, gave me opportunity of fishing diverse objects from the sea, as there was even a more perfect calm than on the preceding days. The first thing I found was a kind of Perch. I have already given a description thereof above. They looked in the water as if their backs were red, and swam about in thousands; but out of water their backs seemed to be of a dirty green; the stomach was silvery white; the head green like the back and the sides. Wherever it was green it was speckled with some silvery green spots, and it was darker on one side. The tail was broad, a little scooped out towards the middle, and had white and dirty-green stripes. The fins of the back had prickles, the longest standing in the middle; they were joined to the second of the backfins, the front part of these being longer than the end of the firstback fins; they were also sharp-pointed; all the others were soft, they were little longer than the front ones they were hardly as long as a finger, but very fleshy. Among the above mentioned there swam another kind of fish, which according to its shape was a kind of Perch. They had wide stripes across their body, were much whiter and about three times as large. There were many

snakes lying on the surface of the calm sea, one kind among them being a species of *Anguis platyura* and very well known to me.

I saw another kind of a rather large size, their backs were brown-green, more like eels; their head was lancet-shaped and pressed flat. Some of them seemed to have yellow lipped-mouths. Their tail was pointed and I observed that they had big spots of yellow, brown, and black colour. They came quite close to the ship and snapped at the small fish. I cannot classify them with certainty in the family of the Anguicides.

I also found those Mollusks I had seen near the ship at Masulipatam at the time when we were hoisting anchors; the only difference between them being that the ones here were quite white on the upper side, while the others were reddish yellow, but I suppose this colour was only caused by the red colour of the Ghodaveri stream.

9.—There was a swimming Triton. It looked like two bundles consisting of an exceedingly thin membrane, veined, fibrous, slimy and folded together, they were joined by a short stalk looking like a thin thread. The top was rather large, and by means of this the animal could swim upwards, and also descend to the depth of the sea. In swimming all the parts fitted into each other, but when it was taken up, one could scarcely part them without breaking them on account of their utter softness. The best thing with which one could compare these parts would be two bundles of feathers, each feather being able to lengthen or to shorten itself. The body itself was conical. It had some irregular furrows on its back and a sort of crescent shaped shield sticking out a little more at one end; its under part was concave, helmet shaped, and here the first shorter tentacles were to be seen; they were covered with stiff hair on the inside and bent in at the ends, some had between the long tentacles small silvery grains, which were probably their eggs. I am uncertain as regards their number, because they were too close to each other and were very fragile. The other tentacles borne at the end of the body, and bent towards those afore mentioned, were about twelve pairs in number. They were divided at the ends, pressed flat, jointed and covered with stiff transparent hair, which grew on the inner edge. The length of these longer arms was about one inch, they were of rusty yellow colour; the Tentacles standing opposite to these were

not half as long. I counted eight pairs of the long tentacles, the shorter ones standing opposite. I found at the side of a membrane like a cover of the helmet. The base of the tentacles in pairs is knotted and they have hair at their ends and no claws.

Besides these there were still different kinds of Molluscs swimming here; one of them is cylindrical, as long as a finger and quite as thick; its surface was quite covered with lumps or short thick points. Its ends were round and full of these protruding points like the rest of the surface of the body. It consisted of many Tras put together, had rhomboidal scales, which at the upper edge were thinly indented and at the lower edge deeper cut; they were all connected by means of a thread-like gut or canal; this was shortly protruding, thicker, and was smooth and half round; it bore very fine stripes of dark purplish red colour on a white ground. Usually their bodies were divided towards the middle by a partition, the hinder half being a little thinner. Between the scales of the front part, there were many oblong purplish spots near this gut; these were flat, rolled together in spirals, were very thin and looked like flat threads. Whether these were their eggs or whether they were continuations of the big tubes I could not discover; they were however all separated one from the other. In the back part the tube ended without protruding in the least. These mollusks were extremely fragile. One could hardly take them into one's hand when the separate scales fell asunder, and they were all as clear and transparent as the best crystal. One could only discover this animal through the oblong spots and of the gut. In some of the scales I saw a sort of opening in which there was some movement discernible like the beating of a pulse.

I found a peculiar kind of Medusa, but I could not examine it with great care.

Another kind of mollusk was often swimming past the ship. I saw this mollusk sometimes as long as a foot and more than an inch wide; it consisted of a jelly which was of almost equal width except at the ends, where it was not as wide and oblique. It was transparent and white, lined with a beautiful rose pink at the edges; in the middle this edge had a slit on one side, in which one could detect some specially organised parts, as tentacula,

opening for the mouth, etc., but everything was very small, and the whole animal very fragile.

10.—We had some showers with gusts of wind alternating with dead calm, so that we advanced but little. Pullu Lada began to be an aggravating view for us.

Towards the evening we saw some swallows flying over the sea; I had watched them already for some days, but I was in doubt whether these were the kind which build the valuable eatable nests.

In the evening we had strong flashes of lightning, the sky and lightning above Sumatra were very red, but the flashes above Malacca were quite white at times, at least they were very pale.

11.—Strong showers with thunder and changing winds all the morning. There was a small water-spout quite close to the ship. First of all I thought it was a volcano underneath the sea because I could not detect the origin on account of the clouds arising from the sea, for there was a black narrow column of about two feet long in the middle of some waves, more than usually agitated and white and smokelike. This smoke rose in a whirl, following the direction which the wind took; it was as high as a man and of a whitish-yellow colour. Shortly after the column descending from the clouds grew oblique and wound down in snakelike movements; it was about $1\frac{1}{2}$ feet wide and darker than the other clouds. The whole phenomena lasted only half an hour. It looked like a footpath descending from the clouds; the sky round about was covered with small scaly clouds, which were not very dark. The sea had the appearance of being covered with blossoms. This was produced by slimy yellow fibres and filaments; among them were a great quantity of cylindric small bodies, looking like straw and pointed at the two sides. I could not detect any life in them, although they had almost all the same shape.

I caught the kind of Medusa I mentioned yesterday several times to-day. The body is a cone, rounded towards the end; it had eight broad furrows at the sides, the prominent parts have eight nerves, they are jointed with short crossthreads and covered with short soft hair; at the end it has an opening like a funnel; it is concave below and has four threadlike tubular arms, which are twice as long as the whole body, which itself is not

bigger than the upper part of a little finger. It is crystal line white; the nerves and arms are hardly discernible; near the eyes the colour is darker, sometimes pink. In the body of one of these animals we could distinctly see through a quarter of an inch microscope:—fourteen very small crabs, squillas, or sea-fleas, some of them were still perfect, some half dissolved; four very small Mantile, and a little excrement like byssus.

The plate-shaped body of the Medusa porphita drifted past in thousands to day, but their blue arms and some parts were already rotten; all were dead. *Sprus ruber*, a fish nearly one and a half hands long and two hands wide, was caught with the angle; for bait they took a little flesh of the shark. I made the following description of it:—

The mouth had a double round lip and was of medium size without beard. The teeth were all small and regular, and the gums behind the teeth were also sharp. Above the mouth it had an oblong broad hole in the bone which was covered with skin. The nostrils were a little distance apart and round; above the nostrils there were two other holes, oblong and a little larger than the former. The cover of the gill was divided into three parts, the third part being only small and beginning at the edge of the second one; the edges were plain the second and third ended in a soft skin protruding a little. The gill rays were seven in number, their skin being white and the rays themselves were red. The gills themselves were four in number; at their inner edge, they had some double skin-like bones, looking like a comb, they stood apart, were white, bent in at the edges, rather large and sharp at the inner flat side. The first row of these bones was longer than the gills themselves, while the other rows were only short. The forehead was elevated rather flat and round, covered with a very smooth skin. The tongue is round at the end, thin, and only rough at its base.

The eyes were quite protruding, extraordinarily big, the iris was bright red and sparkling as if made from some metal, the pupil was black and big. The breast fins were longish pointed, they had thirteen rays. The fins at the stomach were shorter and had only six rays. The back was covered with fins, consisting of twenty-four rays the front ones being pointed ten the rest ending in a soft skin. The hindmost fins had fourteen rays, those furthest back were somewhat thinner and smaller; the others had

red rays, the membrane between them was dark red or almost brown. The tail was undivided and had eighteen rays of medium size, which are fleshy. The scales were plain. The whole body was of a beautiful silvery vermilion red. This fish was said to have a very good taste and to be very wholesome; it is very flat, and its flesh is very white.

Another specimen of *Sparus* was shortly afterwards caught. It was longer, and not as broad. The head was smaller and it had besides the other teeth, which it had in common with the former specimen, four teeth which were big and conical; they stood in the upper and lower jaw and protruded on both sides. The back was also covered with fins, these being divided in the middle. Its colour was silvery white, and it had golden rhomboid spots at its sides. The cook examined it in his manner much against my wish, before I had finished examining the first specimen.

The wind and weather were almost as contrary to-day as in the days before, so that we did not advance more than three minutes in latitude and about ten in longitude.

12.—In the night a favourable though still weak wind sprang up. Early to-day I saw some brown snakes quite unknown to me, and several of those described before; they were passing the ship, but I was not able to catch any. We saw Pullu Pinang on our left; it is a very fertile island with many high mountains overgrown with trees, producing much Damar.

I saw to-day several swallows, three of them flying lower than the ship, they went towards the sea; at the time we had clear and calm weather. In the afternoon we had strong showers with wind and afterwards dead calm.

A man fell from the top of the highest mast; luckily for him he fell on his left side, more especially on his hip. He had two wounds in his head above the temple. At first he seemed to be in a dangerous condition, his extremities were as if dead, he was unconscious and foamed from the mouth, etc. They bled him and gave him some other remedies, which brought him round again.

The people brought me a bird, which seemed to me to be of a new kind, though the crew declared it to be very well known and called it bubbi (booby;) the description of it follows I have placed it among the Lari. It is fully as big as an ordinary pigeon, so that I first mistook it for one, it also having the same

proportions in its throat. The bill is pressed together and thin, pointed; the upper part is convex, thin, the edge round and smooth and bare at the base; the lower part is straight, with a small elevation towards the middle, as long as the upper part, but thinner. The edges of the upper and the lower part are quite sharp, both parts are smooth and black, one and a quarter of an inch long. The nostrils stand sideways almost in the middle of the bill, they are narrow, sunk in long perforations; there is a small furrow descending from the nostrils which disappears at the sides just before it reaches the end of the bill. The angle of the bill has a short round yellow seam. The tongue is arrow shaped, pointed, a little serrated at the edges, convex, cartilaginous up to the middle, whitish, the lower part fleshy and yellow. The eyebrows have at the lower part fine white feathers. above the eye there is only a small line covered with these feathers, the rest is black. The rainbow-like iris is of a dark yellow, the pupil is black and big. The first feathers of the wings are nine in number, they are a little longer than the tail, the rest are eighteen in number. The tail is divided and has twelve feathers, the two middle ones being a little shorter. The feet are short, thin, pressed together, and black. The three front toes are grown together, one palmate toe, the outer toe has four joints, the second and third only three. They are bent at the end and round; the nails are black and long. The hindmost toe stands a little upwards, is round and seldom touches the ground on which the bird stands; its nail is short. The colour of the head is light ash-grey, under the eyes it is black; the neck, the whole of the back, and the upper coverts of the wings are brown-grey. The feathers of the wings, the first coverts, the ten outer feathers of the tail are black, only the two middle feathers of the tail are of the same colour as the back. I had the good luck to catch two specimens of the same kind on one day, and I compared them.

Towards evening we had a favourable wind and left Pullu Pinang behind us; as it grew dark, the sea was very phosphorescent and from this we concluded that we should have a warm wind. The dolphins chased the smaller fish round the ship during the night, and one could distinctly trace their course by the phosphorescent light of the sea.

Soon there came another fish, it snorted as it swam along,

and the dolphins left the ship; this fish kept a long time near the ship. They said it was the (F. missing in M. S.) which has the beautiful shagreen for its skin.

13.—We had very bad weather last night, heavy storms with thunder and lightning. Early in the morning I saw a snake of about two feet long pass the ship; it was very thin and had a slim little head. its colour was bright yellow, with narrow dark blue stripes across the body. Towards midday I had the opportunity of seeing another specimen of the same kind. This had only very narrow blue stripes about three lines wide, while the yellow was as wide as a finger.

I saw to-day the high mountains of the continent and also those of Pullu Parah, which we passed towards midday; although we were very far from them, we could distinctly see that they were covered with trees up to their very tops, and also more inland there were big forests. The word of Pullu is the Malay name for island. We passed Pullu Din-Din in the afternoon, having Pullu Samlong* straight before us, and Pullu Schar† at our right; the latter is an uninhabited island on the left of the continent.

14. 15. 16.—We had continued contrary winds from the East and South East, strong gusts of rain, which kept us for three days near the Sambilangs islands. (Pulau Sembilan.) I had to limit my observations to whatever object chance might lead past our ship, amongst these was the *Papilio argenor*. Some specimens were driven on board by the violent rain, they were somewhat different from the description Linné gives. The upper wings had black veins on the surface and near the edge there is a spot on each of them. There are three oblong clubshaped wide stripes going from the base towards the inner edge, they are of a faint bluish white colour. At the lower edge there are seven fine stripes between the veins, they are somewhat larger at the top, but very fine towards the edge of the wing, and finish off before reaching the ends of the wings, those at the inner edge are more like fine dots. All these stripes and dots are broader and whiter on the lower side. The lower wings are black on the top at the base, but afterwards they are white with black veins, which looked like an irregular wide band across the wings slanting towards the inner side.

* Pulau Sembilan.

† Pulau Jara.

16.—A scorpion stung me to-night towards nine o'clock as I had put my hand on the railing of the ship, to watch some of the flying fish. It was one of the small grey kind, which are more poisonous than the bigger black ones. The violent pain lasted till morning and the swelling three days after, though I rubbed the place very much with hot oil.

This day I often saw the above mentioned swallow coming from the Din Din and Samblons, dipping into the sea; they came singly or three to five together, seldom more. I therefore directed my attention to the swimming molluscs, in order to discover some new kind, but I did not see any others than those before described and some others known long since to among them was a big medusa, which resembled the *Capellata*; its divided edge was sky blue, and the inner plate purply red. Mr. Dalrymple holds the birds nests to be sea eggs. I carefully looked out for them as well but I did not see any others pass but the *Fucus Sargassum*, *lendigera natans triquetrus*.* We generally sailed at two to three English miles distance from the islands, only this morning we approached the Samblans as near as a quarter of a German mile, and as far as I could make out, the shores were very steep. The rocks in some places had the appearance of columns. One low rock looked from the distance like several boats with open sails; near by this rock was quite white, probably from the excrements of the birds that roosted there. A very violent rain caused the scorpions and scolopendras to leave the chinks of the ship; the former took refuge in my books, and the latter looked out for more sheltered places than those they had left.

17.—We were lucky enough to-day to leave the Sambilans islands and to approach the flat shore of Malacca which is covered down to the sea with a peculiar kind of tree, standing erect and only having single stems. All had small crowns of equal height, so that they looked like reeds,† behind which the crown of high trees stood out. Behind these high trees the mountains rose. They were high, jagged and stretched out for a long distance; they were surrounded by a bluish haze, and according to my opinion they surpassed in height all the mountains I had seen

† No doubt *Casuarinas*.

* He evidently expected to see the edible swallow's nests floating in the sea, in the form of seaweed. The *Fucus Sargassum*, etc., is the common *Sargasso* so abundant in our seas.

before. The water of sea was muddy here and had a whiteish green colour. We cast anchor towards the evening on account of the calm, and during the night I saw from time to time large phosphorescent spots in the sea; sometimes they were stripes about two hundred feet long and one and a half feet wide, which consisted of innumerable small mackerels swimming in shoals, and when they came so close to the ship that one could throw something heavy at them, they all jumped above the water. One must recognise our Creator's providence specially in the circumstance that He has endowed all animals swimming in the sea with this phosphorescent light so that in the lower depths of their dark element they should be able to see whatever is near them.

Towards evening a little swallow had flown into our captain's cabin. Captain Leith as well as his servants, who were natives of Siam and the coasts of Malacca, declared it to be one of those that build the celebrated nests, and that it was of the same kind as those which had almost daily passed us, as they flew deeper into the Straits

18.—We continued our journey with fair wind along the coast of Malacca. The wonderful aspect of the equal-sized trees growing half in the sea water, and being quite unknown to me, increased my wish and longing to study these trees, but in vain. I had to content myself with looking at them through an excellent telescope, a present from the Duchess v. P. Sand. I also saw some small shrubs here and there. My further occupation was to stuff my swallow. The description I have given of these birds only deviates from that of the others in so far as it had a rust coloured throat, which near the breast changed into a sort of dirty black, because there were some black feathers intermixed. The abdomen is white and shiny and soft, the rest of the body is black, on the back and head with a blue gloss over it. The feathers of the tail are twelve in number, the two middle ones being the shortest and having no spots, the other feathers had each one white spot on the inner edge near the end, the outer feathers having the biggest spots; when the feathers lay together the spots formed a sort of band across them, which disappeared at the end of the shortest feathers. The two outer feathers were much longer than the others, and narrow at the ends. The whole bird when I had killed it weighed zij Fij P.M. We were three German miles distant from the shore when

the bird came to the ship.

The high mountains which one could see from a great distance belonged according to our captain to the territory of a king ruling this country; his kingdom is here called the Rhomboish* kingdom, and the coast had been taken from him by some rebellious subjects, who had made themselves kings in opposition to him. It is called the Buk kasis in these parts and specially known under that name at Borneo.

We passed one part of the coast where a cape was projecting, and where many of the afore-mentioned trees grew in the water. Our captain, who during several years had had some commerce on this coast, told us that here a large stream poured its water into the sea, and that one could get the best cane here very cheaply, but that the inhabitants were the greatest scoundrels and murderers, who made commerce very dangerous.

19.—Early to-day we had strong northwesterly wind, combined with rain and a thick atmosphere, we passed the sand and mudbanks of Sallango (Selangor); we could not see the land, but fortunately we perceived the waves breaking at our right. The sea was of a whitish-green colour which was caused by the mud. Towards midday the weather cleared up and we could discover the mountains round the harbour, but soon after we had dead calm, so that we advanced scarcely at all. Afterwards I could see the shore, from which we were only about three quarters of a mile distant, but I could not detect any of those trees which I had so often seen yesterday those that grew in equal height. At least if any of them were there, they were not as high and intermixed with other trees; they grew deep into the water. My captain however disagreed with me, as he said that those trees could only have been Mangrove trees, and not as I had imagined Rotan or cane. They must be a kind of *Rhizophora*, as I concluded from the appearance of their fruits, which frequently drifted by.

20.—With unfavourable wind, yet beautiful weather, we came within a mile's distance from the harbour of Selangor, which is a good place for trade and the residence of a Malay king. At midday we cast anchor here. The trees which grew in such equal size were also here, but only in some places along the coast. Several sea snakes passed the ship; they were about one foot long and had a thin head and body; the head, the back and the

* Rembau.

tail being pitch-black, the sides had brown and yellow spots. I tried to catch some of them, but without success.

With the help of the current and favourable wind, we passed the afore-mentioned harbour in the afternoon at a distance of half a mile; we had to pass several steep cliffs, which stood out of the water. Little grew upon them and they looked as if rivetted together, because there was some red ochre; only one of these cliffs was named in the sea-charts, none of the others were marked at all.

Shortly before sunset I caught a snake two and a half feet long in my net, but the net was too small and our ship moved too fast, so that I could not keep it. Its colour had been purplish red which was divided into lozenges by some black lines. The stomach was white.

A great quantity of the seed of the *Bontia* and different kinds of *costia*, which had all germinated drifted by. The anchor was cast at three o'clock on account of the muddy ground.

21.—Before day-break the anchor was hoisted again, because the current was favourable, but at the entrance of the strait of Callay (*Klang*) it had to be cast again because the wind as well as the stream were against us. At one o'clock in the afternoon the anchor was hoisted again, and the rapid stream which passes the straits had soon taken us up and carried us through the wind would have helped us on very little. The whole channel is not more than 500 steps wide in most places, in some it is even narrower. The islands are all very low and consist of a grey mud, but they are overgrown with creepers and those trees of all equal height, most of them, as far as I could see, were *Rhizophora*. Here and there were some trees, which seemed unknown to me. There was specially one kind of palm, which had no stem at all, but its leaves resembled those of the coco-trees, only the separate leaflets were broader and flatter.* There are many small channels traversing these islands, which were not marked on the charts, but they enhance the beauty for those passing by. In the middle of this sound there was a wider channel branching off, forming the island Pullu Loometh.† The unfavourable wind and stream forced us to cast our anchor towards evening; we were still in the mouth of this channel.

* *Nipa fruticans*, L.

† Pulau Lumut

The birds and animals intoned their evening song, rendering our involuntary rest agreeable.

22.—Early before daybreak the anchors were hoisted and we continued our journey; but the wind was weak and contrary and we did not advance more than half a German mile outside the mouth of the channel, so that at 9 o'clock in the morning the anchor was cast again. I was lucky enough to persuade the captain to let me go on shore. On account of the current I chose a part on the island Lasmet* whither a boat took me. This small journey, scarcely half a mile from the ship, took a considerable time as the stream soon turned against us and brought us back into the channel, so that we only arrived at 12 o'clock.

The shore was rather high and covered with sand. Above this sand was a layer of grey clay, which was very soft and sticky; the soil higher than the present level of the sea was very uneven, full of holes and had been everywhere perforated by the crabs. There were many fallen trees near the sea, the stems of some of them were incrustated with *Anomia*.

The first plant I came across was a big *Osmunda*, which might have been the variety *regalis* of Mr. Arch. v. Linnè, but its stipes had prickles at the base, the pinnæ are broad at the edge and creeping, much longer; there were only a few leaves and the whole plant was of a man's height; the roots were thicker than my hand and full of concentric spiral scars; the colour was black,† I hardly saw any other trees than *Rhizophora*, There were some climbing plants, which however had no leaves, because the rainy season had just begun on this coast. I searched very much for some kind of grass, but saw none; some grasslike putrid leaves were lying near the shore. I saw a great quantity of those palmtrees with the leaves which resemble those of the coco tree and was lucky in getting many of their blossoms. (*Then follows a long description of the Nipa palm which it is unnecessary to insert.*)

The only big bird I had time to see was a Malabar bird, besides some medium-sized *Tringas* and some sparrows; I caught some beautifully coloured crabs, one of their claws being very big.

They gave us a signal from our ship, by firing off a cannon, and so I was obliged to stop further researches, and we had to

* Evidently Pulau Lumut.

† Probably *Acrostichum aureum*.

hurry to reach the ship, which meanwhile had spread its sails; I had only been on shore for half an hour. With favourable but weak wind we came as far as the Parcellac mountain, where we cast anchor.

23.—After we had remained here for the night we continued our journey with pretty favourable wind, which however soon changed; we advanced but little and hardly reached Cape Rochard, (Rachado) where we had to cast anchor again.

24.—Early this morning the anchor was hoisted again, and we passed the point of land called Cape Rachado, and could see the trees on the coast of Sumatra. There were many big sea-birds here, but they kept at a distance. We had the small islands in front of Malacca, called the Water islands, just before us, and passed one of them on our left. Its soil seemed to be quite red; it is here that the natives get the red colour with which they paint their ships. At about ten o'clock we cast anchor in harbour of Malacca, where the custom house was filled with Chinese, and a great quantity of sacks filled with sago were lying in the street.

The greater part of the first large lane, which one enters as soon as one reaches the town, consists of Chinese houses and Chinese booths wherein they offer diverse things for sale; only few of them had exhibited anything remarkable, as porcelain etc. Some of these booths were chemist's shops. In this street there was a large quantity of Cattu Camber* spread out on nets to dry; this is also made here but only the cheap kind. They assured me that the Terra catechu was better made here than anywhere else, because the plant grows here in greater abundance. We took lodgings in a house, where the English are generally in the habit of staying. This, like most of the houses in which Europeans live here, was built in the Chinese style, consisting of two stories and a protruding roof, only the stories were higher in this instance. There was a long courtyard descending towards the sea, it had small rooms on both sides, mostly used as stables, kitchen and accommodations for domestic animals; it was called Gmor. The sea was dammed in by some piles, which were about two men's height and two arms thick; they were driven into the ground slantingly. Towards the middle this courtyard projected into the sea, and there had been a cool dining-

* Gambir.

room built on strong poles. Nearly all the houses facing the sea were built in the same manner. Before this dining pavilion grew on either side a big tree; the leaves were bifarious, on long thread-like alternate stalks, the leaflets were oval, pointed and finely ribbed. The pods, which were ripe now and still grew in great abundance near the top of the tree, showed them to be a *Pterocarpus*.* There were no blossoms on them now, but they resembled those trees which I had seen near Tofuapaduan in Wannis, and the Malays also told me, that a red sap flowed out of them if one cut a hole into the tree; this sap was regarded as a great remedy here, as well as in Ceylon. The short time did not admit of any further researches concerning these trees.

The great fertility of these parts is shown in the great variety of fruits with which their markets (Bassore) are filled. All these fruits were of extraordinary size and very agreeable in taste. Many Chinese also brought fruit to the different houses in large quantities, though this is not the time when most fruits are ripe.

The best of fruits were two kind of Durions; one of them† was of the size of an apricot and had a smooth dark brown rather fleshy and astringent peel which was about two lines thick; at the upper end of the fruit grows a star, consisting of five to seven parts with blunt edges; this star shows into how many parts the flesh of the inside is divided. The fleshy part is ball-shaped, has sometimes seven, but more frequently less, divisions; each of these divisions is round at the outer side and the inner one has the shape of a two-sided wedge, all hang together by a spongy kind of white receptacle. The fleshy part is milky white in appearance, little transparent, and of a substance easily melting in the mouth; it is agreeably sweet mixed with very little acid. Some of these divisions contain a kernel, which is almost round, a little flat at the sides, green, but covered with a red membrane which has a bitter taste when it is bitten through. Those divisions containing the kernels are bigger than the rest; they seldom have more than two kernels in one division.

The second kind has an ochre colour and is covered with soft delicate hair; they have neither a calyx nor the star at the top; their taste is somewhat acid and not as nice.‡

* The Angsana. *Pterocarpus indicus*, L. Big trees of which can still be seen in Malacca.

† Evidently Mangosteen.

‡ Perhaps Rambai.

A third kind was only half as big and was called Rangostan.* The fruits were not quite round and covered with long green fibrils, which were very much like prickles. The peel was red, the fleshy part of the inside like that of the others; they were not much thought of and only eaten by common people. There was still another kind of fruit with a peel like the second kind I mentioned, mangostan or *Garcinia celebica*; the fleshy part was the same only it had no divisions and only one seed, which was round, compressed with a big style at one side; it had a chestnut-coloured peel.

In the afternoon I went out in spite of the rain, but could make very few reseaches on that account. The only remarkable thing I found was a *Syngenesia*, the calyx of which resembled that of a *Chrysocoma*; the blossoms themselves were reddish, obversely oval, with serrated edges, it was a shrub of about half man's height and grew in marshy soil.† I found there also two *Cyperis* which were new to me, and the *Leonurus* with the divided leaves; *Cassia occidentalis* grew frequently along the hedges.

The governor Abester, who was supposed to go to Tranquebar, and whom we thought already lost on the coast of Coromandel, had happily arrived herewith his family and belongings; they had contrary wind on their way, which had detained them. He was obliged to stop here on account of the rainy season on that coast.

25. To-day I paid my first calls on the surgeons, who are the only doctors here and are all Germans. I wanted specially to see Mr. Werth, who has lived here already twenty years, and was well acquainted with these parts. therefore asked him about the dragon's blood, and he assured me that it was often made from a kind of reed bearing red blossoms, which frequently grows in Sumatra, specially in a place where the Dutch have an office and a district called Liat. He told me that the sago was not made here but was brought hither from other places, especially from the island (missing in M. S.) and from Sumatra, but that there were also some sago trees in the wood of this neighbourhood. The best mangosteen trees grow in the wilderness, specially in mountainous parts; in the gardens they lose their delicious taste.

* Rambutan.

† *Pluchea indica*.

The most frequent illness here is cardialgy, of which many people died; dysentery was not as dangerous here as in many other parts of India, specially Batavia. There were few contagious kinds of illness, and people leading a regular life grew very old.

Rays de Madre de Deus was well known here, specially among the Portuguese; it is sent from here to Goa, and grows pretty frequently in the jungles. The hospital had at present about twenty inmates, most of them suffering from the venereal disease. I found many kinds of *Filices* near the old walls of the town only few of them had any pericarps left; among them was *Polypodium lanceolatum*. The *Aggyneia* generally very big on this coast, only was very small here; near the wall grew *Oldenlandia*, *Urtica interrupta*, *Bryum murale*, *Hypnum sericeum*, *Eclipta*; at the side of the lane grew a *Conyza* which was unknown to me, and *Morinda citrifolia* was in blossom, although it was not two feet high. There were few kinds of grasses in bloom, only *Scirpus corymbosus* and *Cyperus* were among them. *Paspalum*, *Agrostis cruciata*, *Cynosurus indicus*, and the new kind of grass which I had found in Madrepolam grew here, and also the species of *Aira* with a long compressed panicle I found here, and it was in bloom. Although the ground was covered with green grasses few of them had reached their perfection on account of the rainy season, which was just beginning.

In a garden I found the kind of grass the roots of which when dried smell so agreeably, they furnish the Tenschaurian fans and the roofs of the Palanquins. Generally they extend over much land near the rivers hindering the Palanquin bearers very much. I have already described it before and called them *Andropogon echinatum*. The blossoms have no awn. The male ones as well as the hermaphroditical spikelets are twisted a little at the end and at the side they are overgrown with tiny prickles. The anthers are yellow-green, and the pistil purplish red.*

In the afternoon I went to the north part of the Tranchur, where one has many gardens on one side and the harbour on the left. There was a beautiful smooth and even avenue, consisting only of big *Pterocarpus* trees. They were all covered with foliage, but had not a single blossom. The branches, which bore

* *Andropogon muricatus* Retz. The retiver.

the alternate ovate leaves, bent very much because they are thin and threadlike. Most of their stems were covered with parasitical plants, either with a kind of *Contorta* (*Apocynaceæ*) unknown to me, which had round leaves and *linear follicles* grooved at the base, and beaked, but no blossoms, or they were *Filices* or *Orchids*. There were some others, which I was not able to classify at all.

The sea coco tree I saw in the garden formerly belonging to a curious man, who had been a great friend of science, a Mr. Bartolmei de Vents, who had died a short time previously. His death is the more deplorable as, besides his riches and his love for science and the knowledge he had acquired therein, he possessed much land here, and was highly respected by the Malays, who generally are so treacherous and dangerous. A nut of this sea coco tree was still lying on the ground and out of it had sprung a root, descending into the ground, but no stem has as yet formed. The leaves being still young and not yet divided into strips resembled those of the ordinary coco-trees, only the folds were much narrower and the leaf itself wider than those of the young coco-trees; the tree was three years old, and a second one, which was full grown had died the year before. (*Lodoicen seychellarum*).

*Cynomorium cauliflorum** had fruits and blossoms; the people said that if they did not enclose the tree in matting or a kind of hedge, so that it was dark, it was ashamed to bear fruit therefore all the stems were surrounded with cocomats. The fruit is eaten. In another garden, close to this one, the possession of a Portuguese widow, I saw several trees of the *Theobroma Cocoa*. They had many blossoms and fruits, which like those of the *Cynomorium* grew on the stem and the largest branches in short fascicles; the owner promised to give me many fruits and some young plants. In a little garden she had some plants of the blue *Capsicum*; all of this tree was blue, even the fruits were of a blue black. *Piper nigrum* climbed upon an old stem of a *Maringos* tree and had blossoms and fruits; *Piper Siriboa*† grew along a hedge. There also was a plant with beautiful whitish linear leaves, but without blossom, they called it the Chinese vermouth.‡ There were also some *Dianthus* with double blossoms. *Dolichos Soya* and *Dolychos* with a winged pod had been planted

* *Cymometra Cauliflora* (the Nam-Nam)

† *Betel pepper*. ‡ Probably *Artemisia*

in some places. *Gomphrena globosa*, *Celosia cristata*, *Amaranthus tricolor* grew at the door leading to the big garden. *Pancreatium Leylanicum* grew here wild among the trees. In an avenue of Areca trees I found near the root of one of them an unknown kind of palm. Birds had probably brought the fruit hither, and had eaten it on one of the trees, whence it had fallen down and had grown there. This palm was very frequent here, but none of them had more than two or three leaves, which were all fan-shaped with blunt ends. The stalk of the leaves was prickly. I was told that they grow often in the jungles but do not grow higher than a man. They are of no real use.* Wherever I went I saw parasitical plants and I also found some kinds of moss. I was sorry not to have been able to find any thing more of interest in this place so favourable to natural science, but I overcame my disappointment reflecting that this was an unfavourable season, and hoping to be able to revisit the place soon under more favourable circumstances.

The soil here consisted of a fertile black mould. Many of the gardens lay near a swamp so were partly swampy themselves; they all lie low not far from a river, which empties itself into the sea between the town and frequently floods the neighbouring country. I had no opportunity to see any kind of stones and there was nobody here who might have given me any information concerning them. The sea shore was very muddy and I could not go to the islands for want of time.

26.—We had to pack our things together and towards mid-day we left the country; however the wind soon changed and was contrary so that we had to cast anchor again.

27.—Quite early the anchor was hoisted, and we passed the islands pretty closely; they were all quite small and consisted mostly of stones, but nevertheless they were covered with trees. Our joy soon ceased, as we lost the favourable wind till nearly evening, and the anchor had to be let down, as the current would otherwise have drifted us towards the islands. In the evening we had much thunder and lightning from the direction of Sumatra, but only a small part of the thunderstorm was driven to us by the wind.

28.—We sailed a little to-day with the help of the six hour's current, but the wind was entirely contrary. We saw the mountains of Moor (Muar) and further on Cape Formosa,† the

* *Licuala*,

† Batu Pahat

anchor was soon cast, as the current was against us. As soon as it grew dark we had lightning all around us.

29.—During the night the anchor was hoisted, and at day-break we were near the coast of Sumatra and the island Pullu Rimpet, but we had to keep our ship off on account of the coast being dangerous in these parts. Before evening we succeeded in reaching the land and we cast anchor between the mountain Moor and Cape Formosa near a point of land stretching out into the sea.

30.—During the early hours we sailed on, making use of the weak wind and the current, but soon afterwards we had contrary wind, which was followed by perfect calm, so we remained near a place which was indeed called Formosa, which however for us was very inconvenient. We had strong lightning all around.

OCTOBER 1.—We passed the Strait of Malacca. The weather did not change; we had some wind in the early morning, which however passed away very soon.

2.—The anchor was hoisted to-day, because we had favourable wind; we passed the island of Pullu Pisang at about one mile's distance. Towards the afternoon the anchor was cast again, because the wind was contrary. Much seed of the *Rhizophora*, *Fuci* and other seeds drifted past our ship carried by a strong current and also some single leaves of the *Acorus Marinus* Rumph.*

Then there was some water of a bright-red colour floating past the ship, forming either large veins or spots. Some pails were let down in order to obtain some of this water. I took much trouble to discover the cause of this red colour. I strained a pail full through a piece of new linen without finding anything but a few flea-crabs. Under the microscope which was a quarter of an inch I saw many *Volvoces polymorpha*: at times they had the shape of a bell or that of a triangle and sometimes they had a tail. All of them were of a dark green colour.† I could not find out whether the cause of the red colour was some kind of seed floating on it or some solution of gold particles which are formed in the mountains and at this time might be washed down by the heavy rains.

We could not advance in these days on account of the contrary wind and so we crossed between the head land Mount Formosa and the Bisangs islands. These islands are four in number,

* *Enhalus acoroides*.

† *Infusoria*.

they are very high, covered with trees and intersected by small channels. The most annoying circumstance for our journey was the current being against us. In the evening we had happily advanced so far that we could cast our anchor at the side of Pullu Bisangs.

4.—We were lucky to-day and advanced quicker than we had done since we were in the Straits of Malacca. We passed the low country, which on the Malay coast is intersected by natural canals and overgrown with high trees even down to the water, as in Salingor and Pullu Calang. On our right we had the northern part of the mountainous islands called Pullu Cariman; in front of them there were two dome-shaped islands, which only consisted of rocks and yet were overgrown with trees. They are called the "Two Brothers," in sea-charts. There was a third smaller island, which was not marked upon the charts. In the evening we passed the low island on our left, which is called Pullu Cocob (Kukub) and as the rapid current was against us, the anchor was cast at the cape Tanjong Bouro.*

The common sea weeds passed our ship oftener than usual; they were only *Sargassum*.

5.—The anchor was hoisted quite early this morning, and the wind, which at first was weak, grew stronger and more favourable. Two small Malay ships were in front of us, but they soon changed their course and went deeper into the strait between the islands. After we were at some distance from the Cariman islands, we passed a great number of islands, but only few of them were marked on the charts. We left the route to Batavia on our left and passed some very low islands, amongst them the so-called "Three Islands," which are quite low and only recognisable by three trees growing upon them. At their north-eastern side the soil seemed to be red. A little further on we also saw the island which is called the red (missing in M. S.); it consisted of red sand, and there was a little grove on it, which looked very charming and shady. There grew no other trees on this island, which also was low.

The rest of the islands were higher; the shore consisted of red sand and further inland they were stony with easily discernible strata, and few of them had, higher than the water would rise, some quite white strata.

* Tanjong Bulus.

In the afternoon we passed quite close by two small islands, which the English call the Rabbets and Cunni (Coney),* on account of the similarity of their shape. They looked like an oblong vault and one of them had on one extremity two trees ending in a point, which represent the ears. These trees seemed to me a kind of cedar. I could study the strata of these islands more closely. They seemed to consist of a fine sort of stone with a white weather-beaten surface. My captain told me he had often seen this kind of stone in these parts, and that it varies in colour from red to yellow, sometimes even to black. He said they were friable and smooth and could be cut. I could not decide whether this was the Chinese soap-stone or not.

To my great astonishment I saw very few birds in these parts; only now and then the kind of swallow I mentioned before and only one Malabar bird near the Rabbets islands. Through my small telescope I saw a kind of palm unknown to me on the Barn island. This island is very rocky and only separated from the Rabbets by a narrow passage.

We wished to reach the island of St. John to-day but the strong current and weak wind forced us to cast anchor. We saw three Malay rowing boats lying near one of the islands. Towards evening we met a ship returning from Rio to Bengal, which was commanded by a captain Brown.

6.—Towards midnight the anchor was hoisted again. The very strong current took us happily past the islands and in the afternoon towards three o'clock we left the Strait. We had passed the cape Romania, and left the three small islands lying before it on our left. Shortly after we passed Petro Blanco, which is a low rock; it is covered with the dung of birds. I saw often a great quantity of birds flying past, they resembled our ducks both in size and in manner of flight; I never saw this kind before. On the high cliffs of Romania, which are overgrown with trees, I saw a beautiful red blossom on several trees. Though I could distinguish their size I could not distinguish their shape. The shore was also formed of red sand. We passed a ship that carried the Danish flag.

7.—We lay at anchor during the night on account of the calm and the contrary current, but at day-break the anchor was hoisted with favourable wind. At eight o'clock we saw Pullu Tingi and

* Now Raffles lighthouse.

Arop,* which from far appear to have very high mountains like those on Cape Teneriffe, but as we came nearer it appeared that they were not high at all in reality. Shortly after we saw the Pisang islands and towards evening Pullu Timon (Tioman). Towards midday we had a strong shower of rain, and two swallows could easily be caught, as they had got wet. One of them was a little bigger than those that build the nests. The back was grey, strewn with small white specks; the wings were rust-coloured underneath, the rest was dark grey. The smaller one was not like those that build the nests. At the side of the bill it has some stiff bristles. It had eighteen feathers in the wing, nine of each kind, and twelve tail-feathers, which were nearly all of equal length, they were light grey at the outer edges, except the two middle ones. It seemed to be quite a young bird, because it shrieked, when it was touched. The edge of the bill was yellow and the palate and tongue were of the same colour.

A two-mast ship sailing under the Danish flag passed us, just after we had first seen Pullu Aar (Aor).

8.—During the night we had almost entire calm and for a long time we could still see the mountains of the islands Tingi, Pisang and Timon. The first mentioned soon disappeared from our sight, but the others, consisting of several islands, were still visible during the whole day. I stuffed the two birds and renewed my description of the *Hirundo esculenta*.

I had a severe swelling at my left foot, which was partly caused by a cold, partly by the fatigues of the journey and had been aggravated by a fall. This made me somewhat anxious. We were this afternoon 2 degrees 49 minutes of N. L.

9.—During the night we had had calm as before, and Pullu Timon was still distinctly visible, although our captain knew we were eighteen leagues away from it. Some rain showers changed our favourable wind for some time, but it soon turned round again. The air seemed to be cold, but we still had twenty degrees above zero according to Réaumur's thermometer.

12.—During all these days I had to remain in bed on account of a phlegmon (swelling) on my left foot, which at the same time had swollen as far as the knee, on account of an œdematic swelling. To-day I could get up for a little while, and saw a great many *Medusa porphita* passing, which had spread

* Aor.

out their blue tentacles ; among them were some of extraordinary size, the plate-shaped body alone measuring one inch and a half in diameter. This body had fifty-two ring-shaped stripes ; I caught some of them. Some sea snakes also passed our ship and also my swimming triton, but not as often as in the Strait of Malacca. At midday we were at six degrees twenty-three minutes N. Lat., and our captain directed the course of the ship towards the coast of Cambodia.

13.—We had much calm, intermixed with small rain-showers. The water of the sea, which had been so clear before, grew less transparent and darker. We must have had the current in our favour, as we had advanced a whole degree towards the North. A swallow kept up with the ships ; it was the edible swift, and I observed that the white stripe across the tail is very characteristic in this kind.

14-15.—During these two days we had alternate calm and rain showers, with some West wind. We were between the seventh and eighth degree of N. Lat., and our captain reckoned to be near the place where the south-western cape of Cambodia projects into the sea. Here it was that the sea was covered with millions of Medusa, specially on the fifteenth. The cause hereof, they said, was that the currents from the Cochin-Chinese and the Cambodian coast meet here. As I touched the lower part of this Medusa it stuck to my finger by means of the numerous sucking tubes which are short and almost flesh-coloured. Besides this there were many kinds of the crystalline slimy Medusa, among them one having the shape of an oblong sack, with five rust-coloured round spots. The English are said to call this Medusa the Sea-Egg. The spots were of the size of a peppercorn, and the animal was about three inches long and about one and half inch in diameter. I could not obtain any unbroken specimen. A second kind resembled a porpoise. The back is convex, smooth, and consisted of a thick hard crystalline slime. The edge consists of a rather thin transparent membrane and has between eighty and ninety milky tube-like stripes, which at the outer end were somewhat swollen, and at times looked like knots (this however is only momentary, because they again become pointed when the animal stretches them out). There is a second membrane in the disc, separated from the first by a wide bare ring ; this second membrane is also striped with milk-white stripes and is indented at the edge. The largest

of these Medusas was a little more than two inches in width and had one inch in diameter.

16.—To-day the Medusa porphita had entirely disappeared, but the slimy crystalline Medusa appeared still in great quantity; some of them I caught. Among them was also the oblong obtuse angled one with the eight purplish stripes, which I described in the Strait of Malacca. What caught my attention most, was a great quantity of little phosphorescent bodies, which floated in the water at one and two feet depth. Their size when seen in the water seemed to be that of a small pea, and they varied in colour. Some were golden-yellow, others green, but most of them were blue. I caught some with my net; to all appearance they were a kind of Scylla, and consisted of a very fragile crystalline substance. They were oblong, had four projecting lobes, and rounded furrows on the upper part, some phosphorescent lines were marked across them. In front they had a long conical trunk, which was longer than the four lobes; along the middle of this trunk there was also a deliæte green phosphorescent stripe. The real phosphorescent part was in the middle of the body; it was oblong, flat, a little convex on one side, about two lines long and one line wide. It retained its phosphorescent quality even after it has been removed from off the animal. The whole animal was one inch long, the lobes projecting about $\frac{3}{4}$ of an inch.

I made a peculiar observation. Among the Medusa which I had caught, there was a small fish (Ostracion) about half an inch long. I put it among the Medusas and at first it was very lively, but by degrees the slime of these animals enveloped it, and in about one hour its skin, otherwise so hard, had quite dissolved and the fish began to be transparent, more like the Medusas. It seems therefore that this acid slime has been given to them by nature to conform their food to their digestive capacities, because they have no special organs for this purpose. It is just this slime which so easily produces an inflammation on the human hand. The slime of the blue ones has this faculty in particular.

Since we have entered the Chinese sea, we are continually sounding with the plummet, especially since three days the water has not been deeper than fourteen fathoms; and the sounding consisted nearly always of sand mixed with mud. Towards evening some red sea-perch were caught and a large amount of

Silurus Cattus, which the English also call Cat-fish. There were some small shells in the sand as Arcas, Spirea and some others. There was a piece of *Ossa Sepia* (Cuttle fish bone) nearly all devoured by some animals, which stuck to it still and were very small, hardly one line long and $\frac{1}{3}$ of a line in diameter. They were cylindrical, rounded off at both ends, smooth and yellow. They seemed to contain some other body, which showed through the smooth horny skin. They seemed to me to be the eggs of some shell fish. I also found some very small *Turbinites* (Turbos?) upon them. About midday we were on the 8th degree and twenty-five minutes N. Lat., but however we could not detect any trace of the Cambodian coast as yet.

17.—We passed to-day the Pullu Pansangs islands* quite close. We sailed between their inner side and the coast of Cambodia, the latter however we did not see before the afternoon as there was a dense mist, specially over the land. These were the first islands at the entrance to Cancao,† which formerly was a very good place for trade in Gummi-Gutta (gutta percha), wax, sugar and gold, but since the Burmans have ruined it, the place has lost its importance, as people have left it, and little is now imported or exported.

Towards sunset we were met by a very strong current coming from between the islands, which brought with it many thousands of the Medusa Velella; we deemed ourselves at about two miles distance from these islands. We cast anchor in about fourteen fathoms of water on account of the calm and contrary current. The Boobies found their supper in the mud, which contained many fishes as well.

18.—We continued our journey with weak wind but a strong favourable current. There were many things passing our ship, specially sea-snakes, but they were only the common *Anguis platura*. One of them was asleep, it had rolled itself up in a circle, was puffed up and so floated above the water, the whole circle it formed was only half a foot in diameter, while the real length of the snake was two feet and a half. I had almost caught it in my net, which the captain himself was holding, when to my great annoyance a wave lifted the ship higher, so that the edge of the net touched the snake, it woke up with a start and was gone. I also caught to-day *Hippocampus* and *Ophidion*, but both

* Pulau Panjang.

† Kang-kae.

were only small; also a large quantity of the common *Actinias* (sea anemones) which had been detached from the cliffs; they were of an ochre-yellow colour and were as thick and long as a thumb.

A new kind of mollusc passed our ship very frequently. It was of a hard, slimy, transparent substance, and had a large red spot on the upper side, which at times stood out above the water; it was as thick and as long as the thumb. The real description which I made of it is as follows:—

The whole body is a tube, slightly thicker towards the middle. The front part or mouth consists of a large opening. The body is as thick and as long as the thumb, slightly thicker in the middle. The front part or the real mouth is a large opening, so large that a small finger fits in. This mouth has two thick lips curving in the shape of a helmet, they are thinner at the angles, and the upper lip slightly projects over the lower one. The back or upper part of the mollusc is thick and has a little raised part in the middle, and the sides in this place are also thicker and harder. This raised part contains the real stomach. The lower part of the mollusc is not quite so thick, yet widens in the middle. The sides consist of a thinner and softer gelatinous substance. The back part is a tube thinner and longer than the front part; it has plain edges which are very thin. The upper lip has inside a thick round protuberance, which looks like a second lip; at the lower side it has small furrows crossing it. After this it widens and has at the top a trumpet-shaped tube, which was fastened at the upper part by a gelatinous membrane. It has a large opening in front, but it gets thinner and curves gradually upwards, and at last forms a membrane with which it encloses the front part of the stomach, where it forms a little protuberance, has small stripes crossing it and is of a milky colour. The front part of this tube divides into two rounded lobes, which could move freely and could alter their shape according to whatever position they were in. The size of the opening of this tube was about as large as a quill and the thinner end had hardly half a line in diameter. It had many stripes on the surface which however did not affect the inner side, as many particles of dust and other things were freely and quickly expedited to the stomach, without being stopped on the way.

The stomach, as I have already said, is fastened to the upper side of the mollusc: it is quite round and has the size of a grey

pea, to which it also resembles in colour, but when the mollusc swims in the sea, the stomach seems to be red. It consists of a brownish-red skin; in front it is enclosed by the aforementioned tube, and is hardly discernible; at the back there is a large projecting transverse slit turned upwards, from which yellow-green excrements are frequently ejected. I could not detect any finer organs, because the whole body was transparent, except the region immediately round the stomach, which was of a dull milk-colour; there also I could sometimes discern very fine tubes, moving in a snakelike manner in some specimens. I detected a long hairlike tube, running along the back and leaving tiny red spots. The whole body consists of a crystalline hard gelatine only the stomach is brownish-red.

When this animal swims in the sea the stomach is turned upwards, because it is growing at the back, and its mouth lies lower. The back opening of this tubular animal is more horizontal; it constantly draws in much water through its mouth, whereupon it presses its sides together, so that the water is spurted out of the back opening, and this repeated performance, gives the animal a peculiar force to move on rapidly in the water. I have seen some small *Onisci* (crustaceans) near them and in them. I also watched a red worm, about two lines long being sucked in by the mouth. It stopped underneath the smaller tube leading into the stomach, where it remained perfectly motionless as if dead, though shortly before in the water it had moved with great quickness; after a few peristaltic movements, the water seized it and took it out of the animal, and as soon as it was free again it was just so lively as it had been before.

The shape of the mollusc alters as soon as one takes it out of the water, because the hindermost thinner tube draws itself together as far as to the stomach, and the animal resembles a sack, the sides equally shrivel up. In spirits of wine it becomes much smaller and takes a milky colour. I had put a few of them to dry on Chinese blotting paper, and even two hours after, I could detect the contracting movement, though their bodies had contracted to half the usual size. There were a few ants on these animals later on. This mollusc forms quite a special class, and cannot possibly be a *Medusa*.

I stuffed the *Diodon ostingæ* in order to preserve it; the fins had twenty rays at the breast, ten double ones behind and ten rays

in the tail fins. It was prickly all over, blue with black spots.

A mousecoloured swallow, with very long wings came to the ship towards evening, and I caught it alive after dark. In flying it resembled a hawk, as it remained a long time in the air without moving its wings. In colour, size and cry it resembled a bat.

19.—We had cast anchor for the night and in the morning we had a weak wind and passed many islands, which lie near Concas. The first of these were low and small, then there were some small hilly ones, but the larger islands were traversed by cigher mountains, forming a long ridge; they generally rose gradually in the north-west, were highest in the north-east, and came to an end quite abruptly; they were surrounded by a dark blue atmosphere, and were overgrown with trees. The sea-water was not as clear here, but seemed greyish-black when one looked down.

The swallow, which was caught yesterday had a short bill, the upper part of which was a little longer and slightly curved at the end. The nostrils were projecting and had a round edge; the neck was short, the eyes were large, projecting and black; the eyelids were naked, only at the edge they had a single row of small short feathers. The wings were extraordinarily long, longer than the tail, and the feathers at their end were curved in a sword-shape, and were very narrow. The wing had eighteen long feathers, the latter ones being wider and finishing in a slant.

There were ten tail-feathers of almost equal length, the middle ones being only slightly shorter, the ends of these feathers are broad and rounded. The whole tail had scarcely the length of the body. The feet are short and black, the toes as long as the first joint of the foot. The whole body, as I said before, had everywhere the colour of a bat. I stuffed the bird to keep it. We were to-day a little over ten degrees N. Latitude.

20. As we were so near the land, we cast anchor again for the night, but we hoisted it ere daybreak. We had fine weather to-day and I saw a great quantity of the phosphorescent Scyllæ swimming in the sea, but could not catch a single one, because they were at three feet depth, some even at four to six feet. My Tritons and the Medusa I described near Malacca, (the one with the eight red stripes, each red stripe consisting of two rows of red spots ending in a sort of tube) were frequently passing our

ship. Some of these Medusas were longer than a finger, and at the wider end divided in two lobes; I have observed this often, but had not marked it down in my description; the thinner part finishes in a sort of wart, which projects a little. I saw a peculiar animal moving rapidly in the sea after the manner of a worm; it was about one span long and as thick as a quill. I caught many of them, but as soon as they touched the net, they broke into many small pieces, so that I had much difficulty in bringing some of them under the microscope, but succeeded in the end. It was an animal of the same kind of mollusc which I called a new class the day before yesterday, but they hang together by their ends and in this attitude they have four corners obtuse at the ends, only one little piece sticking out at each end. Each separate piece is of the length of a coffee-berry, but is not quite as thick at their hindmost part. The ballshaped stomach is easily recognisable on account of its opaque colour; which in some is dark green, in others blue or yellow, and is as big as a mustard seed. They were specially conspicuous when swimming, because their movements were like those of a worm, and very differete from those of any other mollusc. As soon as I put them into water, their movements were very rapid, so that before I could examine them properly, I thought them to be *Volvox* because the body was as transparent as the clearest crystal. The principal difference between the *Volvox* and this animal is, that it has a conically projecting point at both ends; that the mouth as well as the opening at the back are placed under this projecting point, and the greatest difference is, that there is not such a free passage for the water in their body as in that of the former, because there are some valves in their mouths and the divided trumpet like tube is not as large at the beginning. I could distinctly see the valves at the two opposite sides. The long thin tube being on the side where the stomach is attached really comes from the stomach, and is somewhat thicker in the beginning, ending in a point nearer the mouth.

There was still another species or variety of these molluscs swimming past the ship: the trumpet-shaped tube was of a blue colour, and one could distinctly see the grooves or better the transverse furrows, which were very close together. The stomach was green and the opening at the back of a bright orange-red.

As I cannot describe everything as minutely as I ought to, I will note down whatever I see, in order to tempt others to closer investigation. I shall give special attention to the molluscs.*

I caught to-day some Medusa, of $\frac{3}{4}$ of an inch in diameter. Their disc resembled a convex button and was about $\frac{1}{4}$ of an inch thick, quite smooth and as transparent as a crystal. The outer edge projected a little and had many hairlike threads of a milk-white colour standing apart one from the other, they had not the length of the diameter of the body. Behind these there was a second ring-shaped slightly projecting membrane, having also fine threads which were however shorter, a little thicker, but very thin at their base; they were closely covered with tiny dots, giving these threads a clublike appearance, the disc itself between these threads was naked and quite flat.

21.—There were again many of the new kind of molluscs and also some of those with the blue gut. I further observed, that when freshly taken out of the sea, they had six projecting corners. At both ends they were obtuse, as if cut off; a little thicker in the middle and hardly longer than one inch and $\frac{1}{3}$ of an inch in diameter, at the ends only $\frac{1}{4}$ of an inch in diameter. If one seized it at one of these ends and shook it a little, the inner parts dropped out as if from a sheath; these parts had a thin gelatinous skin, while the outer parts were covered with a thick hard skin. There was only life in the inner parts, and when I threw them back into the water, they continued to live as before, but the blue gut lengthened to three times its usual size, loosened itself from the slimy skin with a jerky movement peculiar to these animals, and I suppose it forms the young animals, because after it had lengthened in this way it had distinctly visible little spots near the stomach, and the blue colour is changed into a green transparent one.

A very large snake passed the ship, and a very pretty small one as well; its belly was chestnut brown and the head and back pitch black; it was one and a half feet in length.

A chain of a foot and a half long, formed by the kind of animals I described yesterday, passed the ship in the afternoon.

* In these days of big, rapidly travelling steamers, a naturalist has no such chance of observing the Jelly fish which Kœnig took such delight in, and probably many of these animals he here describes have not been met with since. (Ed.)

22.—Last night we had a very strong thunderstorm, and as we passed the islands on the Western side, and lay below the high Cambodian mountains, which are also situated on islands, the echo was tremendous. The lighting descended perpendicularly, sometimes in double flashes on the mountains. It was white and at times blue. Just opposite our ship and further north-west, there was another storm cloud which sent forth fewer flashes of lightning, which were rose-coloured.

I dried some specimens of the new kind of mollusc, which for now I will call *Clio*; which they were being dried in the sun their blue gut changed into a beautiful red. I also put some in spirits, also the small ones hanging together, which I will call *Clio concatenata* at present.

At midday many cat fish were caught, *Siluris Cattus*. I made the following description of one which was almost a foot and a half long: The head is flattened and the upper part of the mouth rather projecting and pointed towards the end, flat at the lower side; the lower part of the mouth is large and rounded. At the angles the upper part of the mouth has on both sides a beard, looking like a single thread, which is as long as the head is wide in this place. The lower jaw has four such threads in one row, the mouth is large and has many very short teeth. Above the upper lip there are two round big nostrils on each side, which are quite uncovered.

23—Early this morning, as the weather was fine, the ship was surrounded by many thousands of *Cliones concatenatæ*, some of them being one and a half feet long. To-day I caught again some of the big *Cliones* without sheath and found them full of little *Onisci* (Crustaceans), which animal I described as follows:

The animal is oblong, pointed at both ends, about three lines in length and hardly one in width. The head is covered by a skin, which projects straight out and is pointed towards the end having the shape of a shield; the edges are sharp and concave below. The mouth is slightly projecting below, and is surrounded by some bristles. The antennæ are placed below the mouth at the sides and look like hair; the feet are pressed to the body, they are round at the end and club-shaped, have one joint in the middle and two at the base, they are formed of a horny stiff substance, and are generally as long as the body. The eyes are placed at the side of the head, they are long, big, and green,

The body is covered with ten stripes in the shape of a half circle, and from the ninth near the tail there is a projecting point. All are white with black spots, specially towards the edges. The tail is pointed, heart-shaped, generally flat, and has on each side three pairs of lancet-shaped pointed lobes of unequal length, each of these pairs having a common base. The feet are like those of the whole family.

There was another kind which differed from them in so far, that the projecting point in front, is divided into two parts, and that the short pliable antennæ, are placed immediately underneath; the tail was more concave and had bigger lobes and they were more in number. The whole back is coffee brown. In size and everything else, they are like those I described before.

We saw early this morning the cliff which was wrongly marked in the chart, we passed it and at midday we were on the eleventhth degree thirteen minutes of N. Lat. The wind was only weak and we had showers and storms at intervals.

24.—The blue gut of the *Clio retusa* had turned yellow to-day in spirits, and the *C. concatenata* had given the spirits a milky colour. When the anchors were hoisted this morning they brought up a sort of whitish grey clay, with red and yellow iron particles, it was very soft and fine to the touch, hard and did not effervesce in aqua fortis. There were many shells in this clay, specially little *Turris* and half putrid *Dentalia*. We passed to-day some very high mountains situated on some islands, they were of long extent and formed a continuous ridge with some smaller mountains; they were very much cleft and overgrown with trees down to the sea-shore. In the distance we saw a smaller island, only consisting of some high and small mountains, behind which a place important for commerce was said to be situated; it has a flourishing trade in Gutta percha, Cardamoms and even gold. This place really lies on the land and near it there is a mountain having a table-shaped summit, which must at least be as high as the Table Mountain.

25.—To-day we proceeded with fine weather and favourable wind as far as the little Sinus or the bay of Siam. We passed the cape marked in the charts as Cape Siant, which according to our captain is formed of mountainous islands, and in his opinion the situation marked on the chart is totally wrong, but as this was a point only clear to sailors I did not make any closer inquiry, as

my calling does not demand any minute knowledge of such things. The mountains here were less overgrown. A flat rock, showing little above the surface of the water lay about half a German mile distant from the others, deeper in the sea. At night we again cast anchor.

26.—To-day we had very strong north-east wind, which was very unfavourable for us, as our course was just in that direction. We had on both sides high land; on our left we specially saw the Penno Mountains which the Siamese call, “the mountains with hundred peaks.” Our captain told me that there are abundant gold mines in these mountains, which have however been deserted since the insurrection of the Burmans. The present king of Siam would not have them re-opened, for fear that his nation might again fall into luxury and effeminacy through riches. According to the captain’s version the gold was very fine. The wind increased, and to-wards midday we were driven quite close to the western coast, not far from a place called Pepery,* and there near some very high mountains we were obliged to cast anchor again; a Chinese junk was forced by the weather to do the same. Towards evening the wind calmed down a little, and as we had only about ten fathoms of water, some of our people began to fish. Amongst other fish they caught an *Echineis Naucrates*,† but one could easily see that it was still young, as it was not quite two feet long. The whole body was of a black lead colour, with a bright white stripe on either side underneath, running along the whole length of the body. It sucked the ship so firmly that they tore it a little when they pulled it up. The shield of the head was four inches in length and five quarters of an inch in width; it had twenty-five furrows, which were edged with stiff hair and this part was quite black, and as the animal was damaged I only kept and dried this furrowy part.

I made the following description of two fishes, one of them I believe to be a *Labrus*, the other a perch. The upper lip is a little longer than the lower, broad, shiny, double. The teeth are numerous, sharp, small and of equal size. The nostrils are near the eyes, oblong, with a depression near them, which is smaller than the nostrils. The eyes are rather projecting, big, their iris is gold-coloured, their pupil black and large. The gill-covers are divided crossways, the first one is indented with small teeth,

* Pipri.

† A sucking-fish.

the second one ends in a soft skin, and the gill-cover has seven rays.

The pectoral-fins have fourteen rays, they are long and end in a narrow point. The ventral fins project backwards and consist of six broad, strong rays, which towards the end are divided into many parts. They are only half as long as the pectoral fins, much thicker, and the rays are yellow, while the thin skin is white and transparent.

(27.—We had to lay at anchor.)

The dorsal fins consist of twenty-five rays; the first of these are prickly, and those in the middle are longest; they are fourteen in number and are joined to the shorter prickly ones. They only get longer gradually and shorten just as gradually again, they are thinner and soft at the ends. The hindmost fin consists of rays, the first of them is prickly and quite short, the second one is also prickly and is the longest, both are strong and bony the third is less prickly, also long, but shorter than the others, the rest are soft and thin, and they all are of a yellow colour. The tail is obtuse, a little retuse in the middle and consists of sixteen rays, which are broad and the divide into many parts towards the end. The lateral line is a little bent.

The back is dark silver-coloured and has four transverse, oblong black spots of unequal size, and some irregular black spots at the root of the dorsal fins; all the rest is silver-coloured, the scales are of medium size. The whole fish is not a span long.

The perch seemed to me to be only a variety of the one I found in the Strait of Malacca, but it was much longer. However the description of this one runs also as follows: The lower lip is longest, the upper one is double, the outer edge being flat, golden yellow and shiny. It has many teeth, which stand a little apart from each other; they are sharp and of equal size. The nostrils are in the middle between the lips and the eyes, and have swollen edges inside; they are round and of medium size. There is another pair of holes above them, close to the eyes, these are bigger, stand in a straight line, have there a straight projecting root, and afterwards they go into the head in a more slanting manner.

The gill-covers are divided crossways, the front part is irregular and sharply indented, the back part has first a long sharp bony point, and a little higher towards the head there is another point, much shorter and projecting a little. The rest is covered

with a smooth soft skin, projects only slightly, and below the gill-cover there are six rays, the last of which are hardly discernible.

The pectoral fins are in front of the ventral fins and have at their root a bony plate; the edge slants upwards, is furrowed and indented, and of a silvery colour; it is but small. The fin rays are oblong, thin and lemon-yellow. The ventral fins have six strong rays. The first of them is closely connected with the second, but is a little shorter than the latter, it is strong, bony and ends in a point. The rest of these rays are much divided at their ends and are soft and yellow.

The dorsal fins reach almost over the whole back; they have twenty-two rays, the first of these being prickly at the end, they get gradually longer and in the same manner shorter again in a sort of curve. In the middle of them there is a large black spot, and a smaller one just before the soft fins. These softer fins also describe the same curve as the others.

The hindmost fins consist of nine rays, the three first ones are prickly. The tail is obtuse, and consists of eighteen broad joined rays, it is of medium length and has three broad stripes running down its length, edged by a pale yellow margin.

The whole body is of a white silver colour, with three dark stripes running lengthwise. The lateral line is slightly curved near the stomach, but is straight at the tail; the scales are very small and shiny.

28.—The wind continued to be unfavourable for us, and we tried to reach the other side of the coast in which attempt we were successful: the western coast had higher mountains, though the shore itself was flat, and we could distinctly see the shores on both sides. As we came near the Eastern coast, we saw much sea-weed drifting past our ship, which I could not examine any closer. Before on the western side there had been many shoots sprung up from the seed of the *Bontia* drifting past our ship. The *Bontia* however seemed to me to be slightly different from the ones we had seen on the coast of Coromandel, Ceylon and that of Malacca.

27.—We lay at anchor at the same place as yesterday, and could not do anything on account of the strong wind.

29.—To-day we passed some time in crossing from one side of the inner bay to the other, and the nature of the different things, which drifted along the coast, showed us near which coast

we were at the time, and what kind of soil the land consisted of. At the western side floated much seed of the *Rhizophora*, my new palm, and also still of another kind of palm which I do not yet know specially often completely germinated seed of the *Bontia germinans*, while near the eastern side there was nothing else to be seen but only sea weeds. I had at last the good luck to-day to catch a sea-snake. It did not seem any other kind than the *Anguis Platura*, but it had the peculiarity that the scales were six to seven cornered and had a raised point in the middle, which near the belly were so big as to form real prickles. Another of the same kind of snakes floated past the ship; it was asleep and I could again observe that it lay on its back, with strongly puffed up stomach; that the head did not stand out above the surface of the water more than the stomach, and that it was so closely twined together that it occupied only a small space.

To-day they caught again an *Echineis Naucrates* with the angle. It was little more than two feet long, its colour was ashy-grey and the white line near the stomach was very inconspicuous. It had this peculiarity, that the projecting point of the mouth was flat underneath and fine sharp points, like a fine shagreen. The pectoral fins had twenty rays; the ventral fins stood closely together at the base, and had five rays. The dorsal fins had thirty-six rays; the hindmost fins had thirty-five rays. The tail was less forked than that of the others and had twenty-five rays. The gill-cover had six rays. The shield over the head, which the animal uses for the purpose of sucking, had only twenty-three scales which were indented at the edges. In the middle of these scales was a bone running lengthwise, and they were fastened to this bone at their inner side. This bone serves to give them more strength.

30.—Last night and to-day, though the wind was contrary it was so weak, that we advanced much. We passed one arm of the stream, which we were to sail up in order to come to the capital of Siam, called Bangkok, and we deemed ourselves at two miles distance from this town. The coast was very low here; though we were hardly three quarters of a mile from it, we could only distinguish very little of the trees, which seemed also to grow here on the western shore as in many places of the Malay coast.

The sea-water was very turbid here, and a rust-coloured

scum was frequently floating on the water. The ground seemed to be formed of some greenish mud, which when dry changed into a fine clay. At midday the anchors were cast for a short time, and two sea-snakes, *Anguis platura*. were caught with the angle. As they were only of the common kind, I put them back into the water. I only cut off the head of one of them, the rest of the body went down to the bottom of the sea, like the other snake, which still had its head

NOVEMBER 1.—The unfavourable north east wind continued, and was very strong. We had neared the land up to two German miles, but the mouth of the big river which we wanted to enter lay in the very direction from where the wind blew. A *Muscicapa Paradisi*,* with brown feathers and black head, came several times to the ship, but as it was one of the commonest kind I did not mind much that soon after it returned to the land.

3.—We passed the day yesterday lying at anchor; a boat was sent to the shore, which brought us the information that we were lying in a small arm of the river on which the capital of Siam, called Bangkok, is situated, and that the village not far from us was Tadschin. From this village we got some refreshments and two pilots. According to what they said, we had to make two and a half miles more to the north east, in order to come to the right mouth of the river. Before daybreak, the anchors were hoisted, and with slightly more favourable wind we sailed along the coast. The shores seemed to be very low, and were closely overgrown with trees, which like those on the Malay coast were growing in the water. A beautiful kind of Night Moth (*Phalaena Noctua*) came flying from the land. I described it as very similar to the kinds which live on different wild fig trees on the coast of Coromandel, but they are different in so far that their wings have strong veins, which are of a yellowish-grey colour, and have black spots, and while the body of the other kind is generally ochre yellow, this one was beautifully carmine-red and white underneath.

4.—We came to-day to the so-called bar or mouth of the river, and the water was so shallow that at low-tide our ship was fast in the muddy ground, and as the wind as well as the current were against us, the ship was pulled up by means of a small anchor, and we proceeded very slowly. The king of Siam

* Paradise Flycatcher

sent a big sloop with one of his ministers and a Portuguese Mandarin in his service, that they might bring his compliments to the captain and take him to his residence, from which we were still at a distance of four German miles. I was particularly struck with the slavish respect, which the subalterns observe towards the higher officers, for never a subaltern would speak to the higher officer, without folding his hands and lifting them up to his mouth or his forehead, and often they crept on their knees, to do the same thing which we are accustomed to perform standing. Towards evening there came a great number of butterflies, hornets, wasps, and dragonflies and some kinds of bugs flying to our ship, the best among those which I caught, was the biggest *Papilio* I had ever seen. During these days we advanced but little and the longed-for land remained at such a distance that I could not go on shore. Nevertheless we were greeted by the mosquitos, but they were not very numerous.

8.—We advanced a little quicker over the muddy ground during these two days, though the current was against us and the water fell so low, that it was only a few feet deep at low tide but this could not be a great hindrance to us any more because the neighbourhood of the land helped us considerably in tugging up our ship. We had at last the good fortune to enter the Bangkok river, and in the afternoon I went on shore in a small boat. The coast is very flat, and as it was just low-tide, I could walk along the shore, which is overgrown with dense forests. The first plant I came across was *Panicum colonum*. It grew amongst the *Rhizophora candelaria*, which was here only a small shrub, lying in the water. In a smaller arm of the river, which we entered on account of the greater facility it offered for landing, I often saw *Cerbera Mangas*,* and in the muddy soil there was almost no other plant to be seen than *Verbesina biflora*. There was a *Dolichos* climbing upon the trees; it had greenish blossoms in an umbel and the pods were more than half a foot in length; they were also broad and had at both ends a double keel. These pods, as long as they were still green, were covered with shiny stiff hair closely pressed against the pod; this hair stuck to one's finger and burnt much stronger than *Dolichos mucuna urens* and *prusens*, the colour was of a beautiful orange-red.†

* *C. Odollam* L

† Evidently *Mucuna*.

Of the other trees some were unknown to me, others were *Rhizophora*. A squirrel was shot, whereupon the whole wood was filled with the screaming of the monkeys. The back, sides, and tail of this *Sciurus* were dark grey, and towards the surface of the hair yellow; the mouth and the round ears were black, the stomach rust-coloured brown; it was twice as large as the *Sciurus Palmarum*. I searched particularly for grasses, but there were no other species to be found in perfection than *Agrostis cruciata Eleusina indica* at half a man's height and *Scirpus trigynus*; the other kinds had only leaves, which were sharp to the touch and very tall. *Rhizophora candelaria* had three filaments, which were connate in a puffed-up membranaceous tube, and also as many anthers.

The crocodiles swam in front of our boat; they often made a dreadful noise, but the people said we had nothing to fear from them here, they are only dangerous further inland.

9.—Early this morning I left the ship in a boat; the ship had come up to the mouth of the river. Unfavourable wind and the current forced the people who were rowing the boat to try and reach the bank on our left, which we were passing quite closely. The bank was very low, and as we had high-tide it stood under water, but in spite of that it was closely overgrown with different kinds of trees and especially at first I often came across the kind of palm tree that I described at the Malay coast, which seemed to be a very useful tree for the natives of this country, because all the houses are covered with it. I did not see any blossoms or fruits upon them, but if one has seen them once, they are easily recognised. A great number of trees grew in the river and bent their branches down to the water; they were of a new kind. They have a long irregular crown with pendent branches and the leaves are very much like those of the *Jambolifera*,* but the blossoms and fruits are very different. The tree belongs to the *Polyandria* or thirteenth class of Linnæus. The stamens project above the young fruit, on a coloured projecting edge, and grow on the corolla; they are very numerous, about two in each in length, quite white; the style is longer still and the stigma is oval, small, furrowed, pierced, sticky, perfect, and twice as broad as the compressed pistil is thick. The corolla is peculiarly slender as long as the calyx and of a beautiful red colour. The pistil

* *Eugenia jambos*.

remains on the fruit with the expanded six to eight lobes of the calyx, while all other parts of the blossom do not outlast a day, and drop off. The flower opens at nine o'clock, and if one only touched the filaments at midday they would fall off. The people told me that the fruit is eaten by the natives, but that it had very little flesh and a sour taste, but the trees were filled with monkeys searching for these fruits. The complete description is among the descriptions of other Siamese plants, under the name of Lampu.*

We only saw an old man and a woman in a small boat, who picked the fruits which hung near the water, and which therefore the monkeys could not reach. One of these fruits, which was ripe, fell into the water close to my boat, I wanted to get it but it sank straight down to the bottom, and as the water here was several men's depth, I could not fish it out again. Further on I found a great quantity of a kind of *Acanthus*, very much like *ilicifolius*. The stalks, leaves and blossoms are only in so far different that one could not mix up the two kinds. I shall describe it. The blossoms are much smaller and white.†

At a place which was not so much overgrown with trees, and which seemed to lie somewhat higher, though it was also covered with water, I went on shore alone. The leaves of the grasses were mostly growing as high as I was tall, but there were no fruits. *Scirpus trigynus* and *Agrostis cruciata* were rarely to be seen: they grew about two and half feet high. A *Verbesina* with lancet shaped leaves, was the only new thing I came across. Some sort of paths had been made between the grasses, which I intended to follow, but they led to deep holes, which circumstance made me more prudent. At last I came to a deep ditch, where the track seemed to be beaten most, but I was not able to discover any trace of a path on the opposite side; this made me suspect that those paths might have been made by big crocodiles. I had already advanced about one hundred feet, but I now hastily tried to regain the boat. After this I found some new kinds of grass, which I intend to examine more closely. A violent shower of rain made me long very much for our arrival at Bangkok, and we reached the town towards evening, after having been obliged to fight against the wind and the current for three German miles.

10.—Early this morning I surveyed the neighbourhood, but it was impossible to go out. The house where I stayed was

* *A Barringtonia*.

† *Acanthus ebracteatus*, Vahl.

built on poles, which stood about a man's height above the ground and were driven into deep mud, which when the tide was high was entirely covered with water. The large stream, which passed quite close near the house, was here hardly half a cannon-shot wide, and on both its shores there were houses built on poles like ours, or floating houses. Almost all these houses were built of bamboo, fastened together with the leaves of the afore-described new palm tree, and their roofs were also covered with the same leaves; only our house, which had been erected quite recently, was built of wood in quite an artistic manner, and covered with slates. There was another better built house near ours, which was destined for the king of Cambodia, who had received an order to come hither and was expected to arrive soon. However, a prince of Cambodia, a near relative of the king, lived in a house which was only built of bamboo and palm-leaves, only it was a little larger than the ordinary houses, about twelve steps long and eight steps wide. His courtiers and servants without exception lived in houses which were not eight steps long and three steps wide; many were even smaller. All these huts stood at our right hand in the mud; they were built irregularly, without any lanes or passages between them. There were only quite narrow footpaths, which sometimes led underneath other houses as access to their own, and when the water was high, they could use small boats, by means of which they also fetched their drinking water from the large river to their houses; but at low tide they waded over knee-deep in the mud, only here and there some thick beams had been laid near to the houses. At our left was the house of the king of Cambodia, who is a vassal of the king of Siam. The house is fenced in by a fence almost two men's height, about three hundred feet in length and two hundred feet in width. The building itself stood about fifty steps far both from the river and from the fence, and closer to the fence at the side turned towards us. A great number of martins sought their food in the mud near the houses. There were two different kinds of them. The smallest was *Gracula cristatella*. Its head is somewhat compressed and at certain movements all the feathers of the forehead and neck stood straight up, which really looked like a tuft; the bill is conical at the base, the upper part has a round edge, both parts are equally long, pointed yellow. The eyes are surrounded by a bare, smooth, indented ring, which is

quite black. The nostrils are half-hidden by the feathers, they are pretty large, The tongue is divided at the end. The wings have fifteen flight-feathers. The tail is oval and consists of fifteen feathers, which are white at the ends; the whole bird being black and only having oblong white spots across the wings. They are half the size of those which one sees so often on the coast of Coromandel, and have a bad smell when one takes them in one's hands. The second kind seemed to me to be the *Gracula calva*, or a new species.

11-14.—During these days we had almost continual rain. I took much trouble to hire or buy a boat, but I was not able to obtain anything from these people in a hurry, because they are both lazy and suspicious, and I had to content myself to remain in the house in as calm a mood as circumstances would permit.

15.—I obtained a boat for hire, with which I went to the Roman Church, which has been established here. There were one bishop and two preachers of French nationality, all directly ordained from Rome, but being paid by France. The Church was like a large barn, built of wooden beams and bamboo, and covered with leaves of the ordinary palm-tree. The altar was only a kind of table, behind which there were some steps, rising pyramidally, some of them being painted with red foliage, and upon one of them stood a small cross, but there were almost no pictures and images besides, as is generally the use in this religion. Before mass one of the preachers preached in Siamese. The Church itself was dry, but round about there was a swamp, which was overgrown with grass, growing higher than a man, and as the water was low I waded through it. I first found a wild shrub, with very far spreading panicles, the stalks standing apart from each other; it was higher than a man. The natives call it in their language the Bird-shrub.

There was a second species growing among them; their panicles were compact, and it had no corolla, but the ordinary scales as nectaries; and a very beautiful paspalum the spikes of which were alternate and patent, and the spikelets were of a pink or purple colour. A high growing kind of grass, which resembles the *Tripsaca* and grew in a deep swamp, I found moreover; and some of the *Schoenus Surinamensis* of Mr. Rottboell I did not see any other kind of grasses here besides *Cyrtosurus*

Indicus, *C. ægyptiacus*, *Panicum colonum*, *P. grossarium*, *Agrostis indica*, *Saccharum diandrum*, *S. spontaneum*, *Convolvulus Turpethum*, *C. paniculatus multiflorus*.

I also saw a *Hedysarum* (*Desmodium*. sp.) the blossoms of which resembled very much those of the *Astragalus Sainfoin* but it had three leaves which were of a silver colour, on the lower side. Many kinds of grasses had only sent out their first shoots, so that I could not recognise them. *Verbesina acmella** was cultivated here.

16-17.—I tried again, but uselessly, to hire a boat.

18.—At last I obtained a boat, for which I was to pay two piasters a month for hire; and for four rowers I had to give one manjang a day, which is the 7th part of a piaster, which made the cost amount altogether to one tikel a day. My first trip was about one English mile north east of the town, to a Siamese Pagoda, situated near the mouth of a smaller arm of the river. The banks were somewhat higher here, but all was wild and left to nature. The building of this Pagoda is only an ordinary house with a small double door and a couple of small windows at the side. It was of medium height, and was built in such manner that the ridge of the roof was slightly raised at the extremities. I could only peep through one of the windows, and saw many gilded and crowned idols of different size on a sort of elevation. In front of the Pagoda, about fifteen steps from it, stood two pyramidal columns on a broad eight-cornered pedestal. In different houses standing apart there live some Talapoins, and near the Pagoda was a big barn, which had a high bench with a sort of banister round it, in the middle; and before it there was a big square enclosure, round which there hung great many carvings, paper flowers, fringes and things of the same ornamental nature; round about there were brick benches. The Talapoins were said to preach their sermons in this building. I made ample botanic discoveries. I found a plant whose corolla was a tube of a bright red colour; it grew upon a pistil, which was compressed and many cornered; as far as I can judge it was a *Thalia*. A great quantity of a kind of *Carex* grew here which I have already described, and among them frequently *Notiva interrupta*. I found a kind of *Rhus* and a specimen of *Dioscorea* in fruit, without blossoms. The former I recognised, having

* *Spilanthes Acmella* Dec.

seen it already before, and the latter from the axillary bulbils which were as round as a ball and had many knots.

Verbesina acmella grew here very frequently. Near the columns grew *Bryum murale*, and near it a special kind of grass which I could not classify among any of the different classes of Linneus. (Then follows a description, rather confused, of the plant, which was apparently Job's tears, *Coix Lachryma Jobi*.)

19—20. I made a description of the plants collected, and tried to find as many of their Siamese names as I could. I also got a kind of fern from the people, which when it is still quite young is eaten as a kind of asparagus.

An unusually heavy and long-lasting rain prevented me from any excursion, and moreover it hindered me in the drying of the collected plants. We had rain during the whole afternoon.

21. One of my crew, after an uncomfortably passed night, was attacked by a nervous illness, called Janun, which is very common in this climate; he had bathed in the early hours. After taking some camphor powders and a mixture of salts, the strain of the nerves subsided, the yawning fits, the nervous dread, and the nausea had passed, a quiet sleep followed and his pulse was good and regular. Afterwards I gave him a mild detergent, which consisted of a solution of tartar, (emetic) but part of it he brought up again. Meanwhile there arrived some native doctors, which were said to be sent hither by the king. At nine o'clock in the morning there came four more, bringing some sacred water from one of their idols. Then they offered up a sacrifice for him to their idols, and then washed his face and body with this water. Nevertheless there was no improvement. The sudden change of temperature which he underwent when they took him out of a very narrow bed and of several yards of flannel, wherein he had been lying for two days, much against my wish, made the perspiration go back and caused a new illness. The native doctors gave him first a mixture of tamarind and the tube-like kasia, which he brought up again, then they give him some of the heart of the Euphorbia, which caused him much pain in his bowels. The danger increased and the learned doctors had to think of some other way to procure him relief. About 9 o'clock some stalks of the Papaya tree with their leaves were brought in; they were about $2\frac{1}{2}$ feet long and about one inch thick. The leaves were taken off and the some-

what thinner end the doctor inserted in the posterior of the invalid, and then he blew through the other end of the stalk. At this operation the invalid began to scream tremendously, the pains augmented, and he lay moaning for more than a quarter of an hour. At last his bowels acted and half an hour after again accompanied with the same groans. I left my obstinate invalid at the request of the priests, recommending him to God's mercy.

22.—The invalid sent for me twice during the night, complaining that he lost much blood by the rectum both in piles and flowing away. The native doctors gave him some astringent remedies, and so I left him in their charge.

After service I went to the temple of an idol, which lay in a wood. I could go there in my boat by rowing up a small stream. I found very many new and rare things botanical *Canna indica* grew here in the swamps, almost the height of two men, it had yellow blossoms. I found one plant here resembling a Rhus; it was in blossom, but it cannot be the afore-mentioned plant, because its nectary resembled that of our lily of the valley, and the peculiarity was that the stamens were only inserted at the outer side of the nectary. The anthers were situated in the opening of their nectary and grew together in a ring; they were five in number; this ring was smaller at the inside and had a reddish colour, and only one style. The fruit is a pear, and is eaten by the people.

Hedysarum triflorum, and *Hedysarum heterocarpum* grew abundantly in the wood, and amongst them climbed *Piper Siviboa*. A new kind of *Phyllanthus* grew here; it was a shrub and had flat berries of an orange-colour, it stood among the kind which has the white berries and the species of this family, which Mr. Burman wrongly calls *Rhamnus vitis-idea*. The most peculiar thing I saw here was a kind of grass, the leaves of which were like the first leaves of the Coco tree, with the same ribbed folds; it was a kind of *Panicum* and grew very high and abundantly among the *Apluda*. *Orieda pinnati-folia* had already dropped its leaves, which seldom last much after sunrise when the dew has half dried away. I saw a second species with linear, lancet-shaped leaves. This was only a shrub of about one and a half men's height. There was a species of *Dolichos* which had pods like those of *D. pruriens*, but its blossoms were very small and blue in colour, while the blossoms of the other are big and black-red.

The pods themselves were cylindrical and rounded off at the ends, while the pods of the other are compressed and the ends are raised. Both kinds however have prickly hair.

The plant which I had thought to be a *Thalia*, I found afterwards to be a *Maranta*, but perfect blossoms were very rare, most of them were putrid from the long duration of the rain, or insects had eaten them. Most of these plants I preserved to describe them next day.

In the afternoon I went into a Chinese temple of idols, which was situated near our house. The Bontzes, or as the Siamese call them the *Ichiton-Chine* or priests, received me kindly. The temple consisted of two buildings which were separated lengthways, and again joined by means of a rather low roof. Inside they looked like a single big room, having at each side a row of pillars constructed of thick beams. Two big lanterns having the look of cages hung before the entrance: they were long and round, about two feet in diameter and three feet long; they were made of very fine rotan plaited together, and covered with some transparent linen, firmly drawn across, upon which large red Chinese letters were traced on one side with ordinary red cinnabar. Inside the temple there were some small divisions near the entrance in which were kept utensils for washing and cleaning purposes. In the middle of this building stood a small square table and some chairs made of lamboo, at which they say their prayers. Before one came to the altar one saw some orange coloured papers hanging from a beam, which were covered with Chinese letters, forming the names of all those who had given presents to this temple. Between the wooden pillars there hung many kinds of painted Chinese lanterns, and at the end there were three altars. On the one at the right hand was an old gilded idol, representing a woman, and many other idols, made of black clay stood also upon it. Some of these idols represented lions, others were of monstrous aspect, these were all idols from Cambodia. At the left was a beautiful and newly gilt idol, also bearing the features of a woman, before it stood some Mandarins and at the sides were some idols about two feet high, having very dreadful faces. They were haggard and looked ready to devour everything.

On the middle altar was the principal god, a gilded idol in a sitting posture and rather more than life size. Before it stood